Journal of FORESTRY

DECEMBER 1957

Including Index

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Volume 55
Number 12

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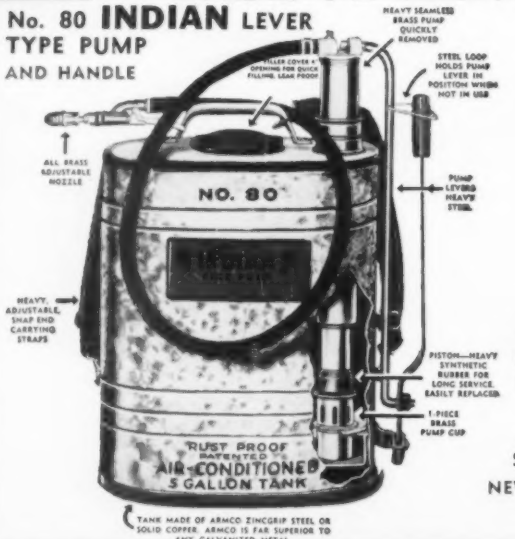
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VOLUME 55 • NUMBER 12 DECEMBER 1957

Journal of Forestry

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The JOURNAL OF FORESTRY, established in 1917, is the official organ of the Society of American Foresters, but the Society assumes no responsibility for the statements and opinions expressed by contributors.

Publication office, 425 Mills Building, 17th Street at Pennsylvania Avenue N. W., Washington 6, D. C. Address all correspondence concerning editorial or business matters to JOURNAL OF FORESTRY, 425 Mills Building, 17th Street at Pennsylvania Avenue N. W., Washington 6, D. C. Published monthly. Subscription $7.50 per year; single copies 75 cents. Missing numbers will be replaced without charge provided claim is made within thirty days after date of the following issue.

The editors are not responsible for loss or damage of manuscripts and photographs while in transit or in their possession. All material submitted for publication should be accompanied by return postage.

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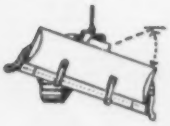

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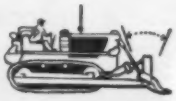

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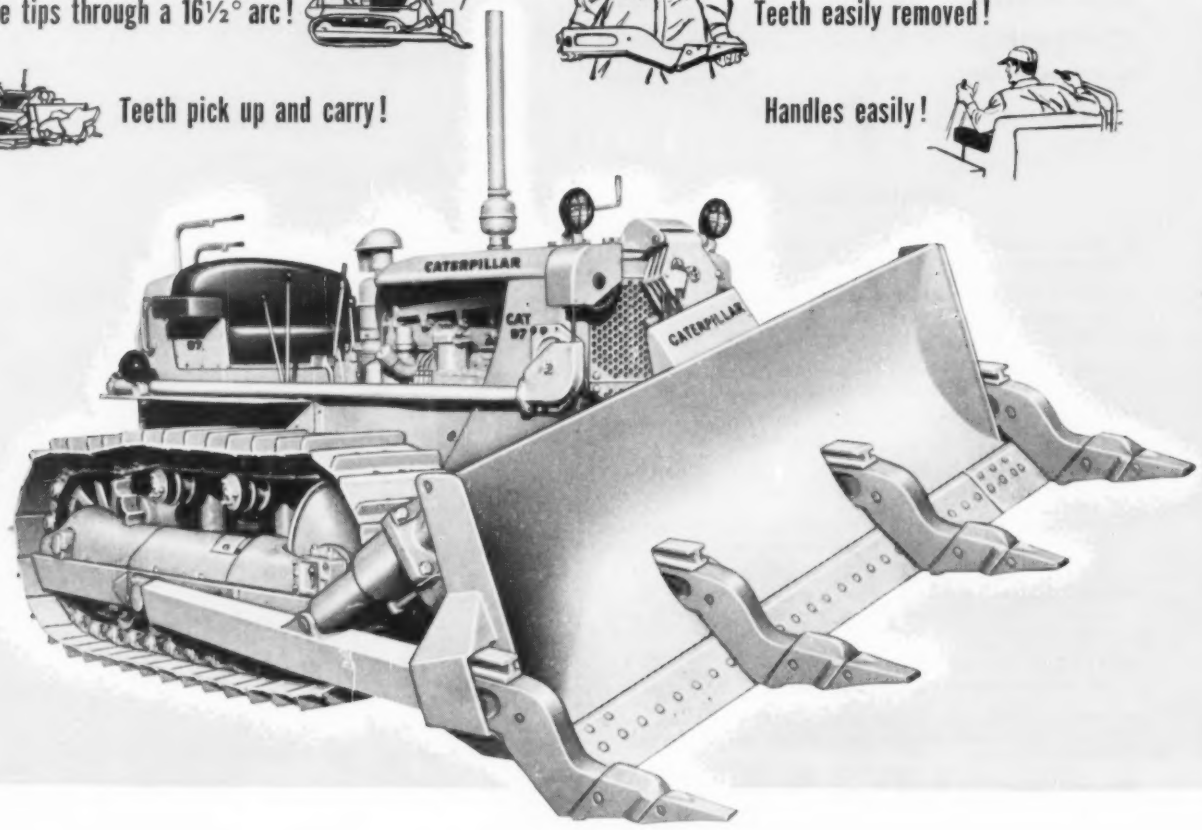

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Journal of Forestry

Official Organ of the Society of American Foresters

The 57th Annual Meeting

Syracuse, New York was the scene of the 57th annual meeting of the Society of American Foresters. Held November 10-13 in the Syracuse Hotel and the Onendaga Hotel, the meeting drew a total of 858 registrants. Of this number 722 were members and guests, 136 were ladies.

A general session, the Society Affairs session, and ten technical Division meetings comprised the three-day formal meetings. In advance of those sessions, two days, November 8 and 9, were devoted to field trips. Related meetings held included the Society's Council for the Advancement of Forestry Education, on November 8; the Council for the Advancement of Forestry Education, on November 8; the Council of Forestry School Executives, November 9; the SAF Council, November 10; and the Association of Consulting Foresters, on the evening of the 10th.

The General Session

The general session on the morning of November 11 was under the chairmanship of Dwight B. Demeritt. President DeWitt Nelson welcomed a capacity audience and introduced Sharon J. Mauhs, New York Commissioner of Conservation, who brought greetings from the Governor. Ralph W. Marquis, Northeastern Forest Experiment Station, launched the meeting on its theme—"Forest Land Use in Transition"—by discussing "The Northeast's Forest Heritage"; E. W. Littlefield, New York Conservation Department, told of the "Impact of Shifting Land Use Patterns on Forest Policies and Programs"; and George A. Garratt, Yale University, considered the "Effect of Land Use Trends on Forestry Needs and Opportunities."

Society Affairs

The annual business session of the Society was conducted by President Nelson. His report and all other reports and discussion will be published in the Society Affairs section of the January issue of the JOURNAL.

Division Meetings

Ten subject Divisions held technical sessions as follows: The Division of Forest Recreation, the Division of Watershed Management, and the Division of Education held evening sessions on November 11. On the following day an all-day session was held by the Division of Silviculture, half-day sessions by the Division of Private Forestry, the Division of Forest-Wildlife Management, the Division of Forest Products, and the Division of Economics and Policy. The Division of Range Management held a joint meeting with the Division of Forest-Wildlife Management on the morning of November 13, while the Division of Forest Management held a full day's session. The Division of Public Relations did not hold a meeting. The business sessions of the Divisions will be reported in the January issue of the JOURNAL; technical papers presented will be published in the *Proceedings* of the meeting.

Social Events and Awards

Scheduled social events included open house at the College of Forestry on the afternoon of November 10 and an evening of entertainment and refreshments on November 12. Numerous alumni groups held meetings throughout the period and the ladies participated in a special program of activities.

The annual Society dinner, climaxing the meeting, was held on the evening of November 13. Four hundred and sixty-nine members and guests were in attendance. Maurice K. Goddard served as toastmaster.

President Nelson presented the Society's third and fourth awards for outstanding achievement in research to Professor Harold J. Lutz of Yale University and, *in absentia*, to Dr. C. Syrach Larsen of the Danish National Arboretum, Dr. Erik Holmsgaard, a friend and colleague, accepted the award for him.

In an unprogrammed presentation, President Nelson awarded the Society's Gifford Pinchot medal for

SPEAKERS at the general session of the Society of American Foresters' 57th annual meeting shown with session Chairman Dwight B. Demeritt, *second from left*. They are: *left*, Dean George A. Garratt; *third from left*, Ralph W. Marquis; and *right*, E. W. Littlefield.

outstanding service to forestry *in absentia* to its executive secretary, Henry Clepper.

Fairfield Osborn, president of the Conservation Foundation, delivered the banquet address on the subject "Natural Resources and World Populations."

Field Trips

Field trips were held on November 8 and 9 in advance of the formal opening of the meeting. Three one-day trips offered a study of land use transition, observation of extensive reforestation results, and a visit to two productive central New York woodlots and the Montezuma National Wildlife Refuge. A two-day trip was devoted to study of forestry in the pine region of the Adirondack Mountains.

Appreciation

The meeting was under the general chairmanship of Hardy L. Shirley. Its Program Committee, headed by Paul M. Dunn, also included William R. Adams, Henry I. Baldwin, E. W. Littlefield, and Roy Olson. Svend O. Heiberg served as chairman of the Committee on Arrangements. To these men, their staffs of Committee workers, and the many persons who contributed to make this annual meeting of the Society one of its finest and most stimulating, all of its members are indebted.

Society of American Foresters Presents Three Awards at Annual Meeting

Presentation of Awards to
Carl Syrach Larsen
and
Harold John Lutz
for Achievement in Research

by DeWitt Nelson, President
Society of American Foresters
Syracuse, New York
November 13, 1957

Last October 17 at the 1956 annual meeting of the Society of American Foresters held in Memphis, Tennessee, I had the honor of making in behalf of the Society the premier presentation of the award for outstanding achievement in biological research contributing to the advancement of forestry. Actually, two awards were made. Each award consisted of an engraved plaque and a check for $100. The recipients were Leo Isaac and Philip C. Wakeley.

Tonight it is my happy duty to make the award again. As was the case last year, there are two recipients. Each will receive an engraved plaque in the enlarged shape of our Society emblem, together with a check for $100.

In authorizing two awards again this year, the Council wished to recognize outstanding achievement in biological research relating to forestry by an American and a foreign investigator. Hereafter the Council's policy will be to make dual awards only on rare occasions; and in fact, in some years no award may be made at all.

But first a word as to the manner in which this award became possible. In 1954 an anonymous donor made a grant of $10,000 to the Society for a purpose that was as appropriate to our profession as his action was generous. The object is to finance awards, on the selection of the Council, "in recognition of outstanding achievement in basic or applied research in any branch of the biological sciences, provided the research contributes, either directly or indirectly, to the advancement of forestry."

CARL SYRACH LARSEN

Unfortunately, the awards—and often the rewards—in forestry are few. Hence, it is again incumbent on me as president of the Society to express sincere thanks to the anonymous friend whose generosity makes it possible for our profession to accord recognition to research workers who have contributed notably to the advancement of forestry, not only in America but in other lands as well.

Thus, it is with especial satisfaction that I present the first award to a distinguished European colleague whose contributions are honored not alone by his own countrymen but throughout the English speaking world.

Botanist, geneticist, silviculturist, author, and research worker, Dr. Carl Syrach Larsen is head of the National Arboretum in Denmark. One of the leading forest geneticists of the world, he is the author of *Forest Tree Breeding*, published in 1934; *the Employment of Species, Types and Individuals in Forestry*, 1937; *Estimation of the Genotype in Forest Trees*, in 1947; the highly regarded book, published in 1957, *Genetics in Silviculture*, and several other fundamental papers on forest tree improvement.

Born July 6, 1898, at the Forest-botanical Garden near Copenhagen, Denmark, of which his father was in charge, and where he himself resides today, he was brought up and lived all his life among trees from all parts of the world.

He received his training in forestry at the Royal Agricultural College of Denmark in 1923, and his doctor's degree from that college in 1937. The same year he became director of the newly established National Arboretum where he expanded his work in forest tree improvement. Numerous foresters and botanists from all parts of the world have visited this arboretum and received the most cordial hospitality from Dr. Larsen.

He has travelled widely, not only in Europe but also in this country, the

Far East, Australia, and New Zealand. Former collaborators and assistants are found today in leading positions on every continent. His ideas and methods are influencing the rapidly expanding field of forest tree improvement wherever it is found. Seed gardens or orchards and the extensive use of vegetative propagation for forest genetic purposes are ideas developed by him.

He has received high honors from his own country as well as from other countries. Among these may be mentioned the Danish Augustinus award in 1952 and a gold medal from the Swedish Forest Society in 1957.

Dr. Larsen, who was unable to be with us during this meeting, has designated a friend and fellow-countryman to receive the award for him. The recipient is Dr. Erik Holmsgaard, the director of the Danish Forest Experiment Station, who during this academic year is a visiting professor of the College of Forestry here at Syracuse.

Dr. Holmsgaard, in behalf of the Society of American Foresters and of the anonymous donor who established the award, I have the honor of presenting to you for transmittal to Dr. Larsen this plaque and this check in recognition of his outstanding achievement in biological research leading to the advancement of forestry.

SAF PRESIDENT DEWITT NELSON, *left*, shown presenting the award for outstanding achievements in research to Professor Harold J. Lutz.

The second recipient of the award is Harold John Lutz of the Yale University School of Forestry. Dr. Lutz is Morris K. Jesup professor of silviculture and director of the Yale program of research in forest biology.

Born August 11, 1900 in Saline, Michigan, he received the B.S. degree from Michigan State University in 1924; and the M.F. degree in 1927, and the Ph.D. degree in 1933 from Yale. Following brief experience in teaching and research elsewhere, Dr. Lutz joined the forestry faculty at Yale in 1933.

His bibliography of nearly fifty publications attests to the breadth and significance of his contributions, not only in forest ecology but in other scientific fields as well. Few American silviculturists have done as much to advance the application of biological knowledge in forestry. Conversely, few silviculturists have achieved such creditable recognition among scientists outside the profession of forestry.

Among his outstanding contributions have been the investigation of forest succession in a variety of different regions ranging from southern New England to Alaska. His technical bulletin, *Ecological Effects of Forest Fires in the Interior of Alaska,* published in 1956 by the U. S. Department of Agriculture, is a definitive work on this important and little-known subject.

One of the leading pioneers in the scientific study of forest soils in America, he has conducted a substantial amount of investigative work in this field, leading to the publication of the book, *Forest Soils,* a comprehensive textbook of which he is the senior author.

While cataloging Harold Lutz's accomplishments in research, let us not overlook another solid achievement—that of a truly inspiring teacher. Literally scores of able silviculturists and forest ecologists on this continent and abroad have derived inspiration and scientific competence from his patient guidance and example. As much as any American forester, he strikingly exemplifies the imaginatively inquiring mind at large in the woods.

Dr. Lutz, in behalf of the Society of American Foresters and of the anonymous donor who established this award, I present you with this plaque and check in recognition of your outstanding achievement in biological research leading to the advancement of forestry.

Presentation of the

Gifford Pinchot Medal to Henry Edward Clepper

By DeWitt Nelson, President, Society of American Foresters
Syracuse, New York, November 13, 1957

The Gifford Pinchot Medal is awarded periodically by the Society of American Foresters for outstanding service to forestry. It commemorates the great American forester who was the first president of the Society, the first Chief of the U. S. Forest Service, and the foremost conservationist of his era.

That the Society views this award as a high honor may be judged by the fact that it has been made but four times in the past.

The first presentation of the Gifford Pinchot Medal was a highlight of the Golden Anniversary meeting of the Society in December 1950 at Washington, D. C. Its first recipient was Henry S. Graves, past president of the Society and dean of the Yale University School of Forestry. The second man to be so honored was Raphael Zon, former editor of the JOURNAL OF FORESTRY and long time director of the Lake States Forest Experiment Station. William L. Hall, charter member of the Society, an early member of the U. S. Forest Service, and now for many years manager of Arkansas timberlands, was the third recipient. Inman F. Eldredge, to whom we refer affectionately as the "dean of southern forestry" was the fourth.

It is now my honor and my keen pleasure to make the fifth presentation of the Pinchot Medal. The recipient is this month in Rome, Italy, representing our Society at a meeting of the Food and Agriculture Organization of the United Nations and participating in planning for the Fifth World Forestry Congress, to be held in the United States in the late summer of 1960. Hence, the medal must be presented *in absentia*.

This individual's outstanding service to forestry lies in his unique service to the profession, a field close to the personal interest of all of us here, and yet one that has far reaching effect in promoting the science, practice, and standards of forestry in America.

HENRY CLEPPER

The man is Henry Clepper, and 1957 is the twentieth anniversary of his assumption of the duties of executive secretary of the Society of American Foresters and managing editor of the JOURNAL OF FORESTRY. He has been a Fellow of the Society since 1949.

Born in the village of Columbia in Gifford Pinchot's home state of Pennsylvania on March 21, 1901, Henry Clepper early developed an interest in forestry and was graduated from the Pennsylvania State Forest Academy at Mont Alto in 1921. At the youthful age of twenty he entered the service of the Commonwealth in the Department of Forests and Waters. He remained with this organization in varying capacities, first in fire control and later as chief of information and education, until 1936. That year he joined the I and E staff of the U. S. Forest Service in Washington, D. C. It is significant to note that by the time he left Pennsylvania he had established his abilities as a writer of both popular and technical material on forestry and conservation and had, in fact, since 1934 served as an associate editor of the JOURNAL OF FORESTRY. The latter, he confides, was one of his earliest ambitions.

In 1937, a year after his move to the Nation's Capitol, Mr. Clepper was offered, and accepted, the post of executive secretary of the 4,000-member Society of American Foresters, then under the presidency of H. H. Chapman. He became at the same time managing editor of the JOURNAL OF FORESTRY. Dr. Henry Schmitz was editor-in-chief.

Twenty years have passed, and except for a wartime leave of absence in 1942-1944 for service as a technical consultant with the War Production Board, Henry Clepper has remained, one might say, in the same position. Although literally true, this would, however, not be an accurate appraisal.

The last two decades have seen tremendous strides forward in American forestry. They have witnessed also a parallel growth in the size, scope, and responsibilities of the profession. These two facts, we may feel with pride, are not unrelated. Our Society now numbers over 11,000. More importantly, it represents over a half century of unified, concerted effort toward common goals and a record of active participation by its membership that is the envy of many of its sister professional organizations. It is an organization whose name is known and respected by all who are concerned with the Nation's renewable natural resources. Its strength lies not in conformity of opinion as to means but in agreement as to goals.

For his service to the objectives of the Society of American Foresters we honor Henry Clepper. He has worked diligently, tactfully, forcefully, and understandingly to represent, advance, and protect the interest and standards of the profession of forestry. He has brilliantly, through his work with Society publications and his leadership in the organization of Society meetings, contributed to the Society's function as a medium for the exchange of professional thought. He has modestly and unobstrusively been a balance wheel in areas of disagreement and a compass for united effort. I am sure that were Gifford Pinchot present he would take much pride in awarding to his fellow Pennsylvanian the medal that bears his name.

The Council has asked E. L. Demmon, immediate past president of the Society, to receive this honor for Henry Clepper.

Mr. Demmon, on behalf of the Society of American Foresters it is with great pleasure that I present to you, for transmittal to Henry Clepper, this Gifford Pinchot Medal for outstanding service to forestry. It carries with it the respect, affection, and esteem of his fellow members, as well as their hope that he may long continue to serve.

Hybrid Danish Willows—Their Early Survival and Growth in Michigan and Northern Wisconsin[1]

V. J. Rudolph,[2]
W. Lemmien,[2]
M. W. Day[2]
C. I. Arnold,[2] and
M. Baum[3]

EXPERIMENTAL PLANTINGS of several hybrid willows obtained from Denmark were made in 1953 in four widely separated locations in Michigan, and one in northern Wisconsin. These plantings were part of the fairly wide introduction of Danish hybrid willow clones into the United States at that time. The purpose of these plantings was to observe the growth of these hybrids which were being very highly recommended at that time by their distributors.[4]

Information on the parentage and development of these hybrids is not available; efforts to obtain such information from Denmark proved unsuccessful.[5] In the meager information available, the growth was described as being so rapid that pulpwood material would be produced in five to seven years. The wood was described as excellent for pulp and paper manufacture, and also for veneer, boxes, and various specialty products.[6]

In the descriptive material available, various clones were recommended for differing planting conditions. Clone 56 was said to grow well under almost all soil conditions, "especially on soil with swampy tendencies"; clones 83 and 87 were recommended for lowlands; clones 50 and 55 for sandy soils; and clones 52, 69, and 167 "for higher and clay-type land."

The Dunbar Forest Planting

The planting in the Upper Peninsula was made at the Dunbar Forest Experiment Station, approximately 16 miles southeast of Sault Ste. Marie, in Chippewa County. The cuttings were planted in May 1953, on an old field which had been abandoned for cultivated use more than 25 years ago. The ground cover before the area was prepared for planting consisted of poverty grass, dewberry, goldenrod, and a few scattered clumps of alder, spirea, and willow, none over 4 feet high. The soil is Bruce fine sandy loam, which is characterized by poor drainage. The area is flat, but water does not stand on it during the growing season. The site was prepared by disking, first with a heavy Athens unit, and then by a regular farm disk, so that the soil was in seedbed condition.

The 1,000 cuttings of clone 56 were hand-planted at a spacing of 6 by 6 feet. The ground was fairly dry at the time of planting, but over an inch of rain fell three days later. There was no further treatment of the planting area. By the end of the first growing season, the soil had a low, light covering of grasses, sedges, dewberry, and spirea. After four growing seasons, the ground cover is similar in composition, and very dense. Some quack grass is scattered through the planting. The herbaceous cover averages 1.2 feet in height, and the few native willows have an average height of 2.5 feet. There are 20 living hybrid willows for a survival of 2 percent. Although frost injury and competition from other vegetation may have been contributing factors, the major cause of the high mortality was not apparent. The surviving stems do not have a vigorous appearance. Their maximum height is 2.2 feet, and the average height is 1.3 feet.

The Kellogg Forest Planting

One of two plantings in southwestern Michigan was made at the Kellogg Forest in northeastern Kalamazoo County near Augusta. The planting site is a gently rolling field that was used for agricultural crops the previous year. The soil is a Fox sandy loam of medium fertility.

The area was plowed and fitted until it was in good seed-bed condition. The 1,880 cuttings of clone 56 were planted 6 feet apart in rows 6 feet apart on April 29 and 30, 1953, using an ice spud to open and close the holes.

During the 1953 growing season, the trees were cultivated five times with a tractor cultivator. They were hand-hoed once to remove the weeds next to the trees. No further weed control was attempted, and a heavy stand of yellow sachet, thistles, timothy, goldenrod, and other weeds developed.

In September 1953, after one growing season, the survival was 81 percent, the average height was 1.5 feet, and the tallest stem was 3.6 feet. In the fall of 1954, the average height was 3.3 feet, and the maximum height was 7.1 feet.

Measurements in November 1956 showed an average height of

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[1]Journal Article 2090 from the Michigan Agricultural Expt. Sta.

[2]Department of Forestry, Michigan State University.

[3]Marathon Corp., Rothschild, Wisconsin.

[4]The cuttings were distributed by U. S. Willow, Inc., 20 Exchange Place, New York 5, N. Y.

[5]In the information available, the originator was listed as Mr. Carl Jensen, Naerum, Denmark.

[6]Appreciation is expressed to E. Kostal, in charge of the Post-Entry Unit, Plant Quarantine Branch, Agricultural Research Service, U. S. Dept. Agric. for most of the general information presented here.

4.4 feet and a maximum height of 8.0 feet, with a survival of 78 percent.

Several insect pests have attacked the trees in this planting. In June 1953, the trees were sprayed with DDT to control the spring canker worm (*Palescrita vernata* [Peck]), and migrating eastern tent caterpillars (*Malacosoma americana* [F.]). One application resulted in good control and no further treatment was necessary. Some injury to smaller branches by tree crickets (*Oecanthus niveus*) was noticed in 1954, and in August 1956, several colonies of the fall webworm (*Hyphantria cunea* [Drury]) were removed from the plantation.

In the spring of 1954, all multiple stems were cut, leaving the one best stem. After four growing seasons, most trees show very poor form; they are very crooked and many have severe sweep. Some stems are nearly prostrate, and many have recently developed new sprouts near the base of the stem.

The Russ Forest Planting

The other planting in southwestern Michigan was made in the Fred Russ Forest located approximately eight miles east of Dowagiac in Cass County. The planting was made on an area used for farm crops for many years. The field is practically level, and the soil is classified as Fox sandy loam.

The area was plowed, disked, and dragged thoroughly before planting. The 2,000 cuttings of clone 56 were hand-planted in late April 1953, at a spacing of 6 by 6 feet. The soil was quite wet at the time of planting. There was no cultivation, but weeds were cut by hand from a small area around each tree later in the growing season.

Observations in the fall of 1953 after the first growing season showed survival of 74 percent; maximum height of 2.4 feet; and an average height of 1.2 feet. A dense stand of ragweed had covered the area, and in general, the weeds were taller than the willows. Much of the mortality was caused by the leaf-cutting bee (*Megachile brevis* Say).

A tally at the beginning of the second growing season in the spring of 1954 showed that the survival had dropped to 30 percent. Winter-killing or late spring frosts had taken a heavy toll of the planting.

During the 1954 growing season, the herbaceous cover changed considerably from predominantly ragweed to more grasses and clover. As in the previous growing season, the overtopping weeds were cut by hand from a small area surrounding each tree.

In the fall of 1954, following two growing seasons, an examination of the area failed to reveal any living willows. Some of the second-year mortality was caused by additional activity of the leaf-cutting bees. At that time, on the recommendation of the inspector from the Bureau of Plant Industry of the Michigan Department of Agriculture, all remaining stems were pulled from the ground and burned.

The Gerber Waste Water Disposal Area Planting[7]

A relatively small planting was made by the Gerber Products Company approximately three miles northeast of Fremont in Newaygo County. It consists of two parts: a planting of 153 cuttings of clones 51, 55, and 56 on an area used to dispose of cannery waste water applied through large nozzle rotary irrigation sprinklers; and the other was a check planting of 15 cuttings of the same clones on an area without the irrigation treatment.

This planting is part of a larger experimental planting including boxelder (*Acer negundo* L.), cottonwood (*Populus deltoides* Bartr.), balsam poplar (*P. balsamifera* L.), and golden willow (*Salix alba var. vitellina* [L.] Stokes) on adjoining areas.

The soil is Ottawa loamy fine sand on an area with gently rolling topography. The field had a light cover of alfalfa, quack grass, and weeds at the time of machine-planting the cuttings to an approximate spacing of 8 by 8 feet. There was no cultivation after planting.

After one growing season, the check or "dry" planting showed a survival of 4 percent, maximum height of 1.0 foot, and an average height of 0.8 feet. In November 1956, after four growing seasons, there were no surviving willows in this part of the planting. Apparently the site was too dry for this species. Quack grass of medium density now covers the area.

During the first growing season, the irrigated planting received approximately 2 inches of waste water per week for 32 weekly sprayings, totalling 64 inches of waste water. During 1954, 1955, and 1956, the spraying extended from mid-April to mid-October for 24 weekly sprayings totaling 48 inches of waste water each year.

First-year survival in the irrigated planting was 48 percent; maximum height was 4.0 feet, and the average height was 1.5 feet. A very luxuriant stand of quack grass had filled the area completely.

In November 1956, after four growing seasons, survival was 10 percent; maximum height 10.5 feet, and average height 7.0 feet. Some winter-killing is evident on the surviving stems, probably as a result of inadequate hardening-off caused by the plentiful moisture supply and the added nutrients in the waste water. The quack grass on the area remains very dense, and its competitive effect may have influenced survival of the willows.

The Marathon Corporation Planting

The northern Wisconsin planting was made by the Marathon Corporation near Rothschild. The cuttings were lined out in transplant beds in April 1953, and the rooted cuttings were planted in their permanent location in May 1954, at a spacing of 5 by 5 feet. Five different clones of the hybrids were used.

The soils on the plantation area vary from Omega sandy loam to

[7]The assistance of M. Dietz of the Gerber Products Company is acknowledged in obtaining data on this planting.

Saugatuck sandy loam, with portions of the latter tending to be somewhat poorly drained. The area has a slope of less than two percent to the south. Depth to the water table as checked during the 1956 growing season averaged 18 inches.

The soil was prepared by plowing and disking, and the trees were cultivated during the first growing season. Four randomized plots of each hybrid clone were planted, with 99 rooted cuttings per plot.

Survival and growth of this planting, along with summarized data and for the other plantings are shown in Table 1.

TABLE 1.—FOUR-YEAR SURVIVAL AND HEIGHT GROWTH FOR FIVE PLANTATIONS OF DANISH HYBRID WILLOWS

Clone no.	Location	Survival	Average height
		Percent	*Feet*
51	Gerber (dry)	0	0
	Gerber (irrigated)	10	7.0
52	Marathon	25	2.8
55	Gerber (dry)	0	0
	Gerber (irrigated)	10	7.0
56	Marathon	5	2.0
	Dunbar	2	1.3
	Gerber (dry)	0	0
	Gerber (irrigated)	10	7.0
	Kellogg	78	4.4
	Russ	0	0
69	Marathon	77	4.8
83	Marathon	.5	2.0
87	Marathon	2	2.0

No phenomenal growth of these hybrids has been observed. In general, mortality has been high, with most of the losses caused by several kinds of grasshoppers. Clone 69 appears to be highly resistant to grasshopper damage, and consequently has shown the best survival and growth.

Some cuttings were made from each clone, and planted in the spring of 1956. This new planting will be protected by spraying from insect damage, so that survival and growth without interference by grasshoppers can be observed.

Summary

Survival and growth observations were made of Danish hybrid willows in one Wisconsin and four Michigan locations. The Wisconsin planting near Rothschild consisted of clones 52, 56, 69, 83, and 87. In the Michigan plantations at the Russ and Kellogg Forests, the Dunbar Forest Experiment Station, and the Gerber farm, clone 56 was used; in the Gerber planting clones 51 and 55 were also used. Information on the parentage of these clones was not available.

In general, survival has been poor, varying from complete mortality (clone 56 at the Russ Forest) to highs of 78 and 77 percent survival (clone 56 at the Kellogg Forest and clone 69 at the Marathon planting).

Growth of these hybrid willow clones has been disappointing and far below the phenomenal rate claimed by the distributors in their promotional material. The average height in the plantings showing the highest survival was between 4 and 5 feet. The few surviving trees in the planting irrigated with cannery waste water averaged 7 feet in height.

Practically all surviving trees show some frost damage. In general, they are very crooked, have poor form, and frequent multiple stems. They were also highly susceptible to various kinds of insect damage, particularly grasshoppers and leaf-cutting bees. Based on their early survival and growth in these plantings, it is doubtful that additional planting of these Danish hybrid willow clones should be encouraged at this time in the Lake States.

Indices to Potential Cone Production of Loblolly Pine

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In 1949 a study was begun in south Arkansas to see if the potential cone production of loblolly pine (*Pinus taeda* L.) seed trees could be predicted from their diameter, crown size, and crown density. Definite relationships between cone productivity and such easily assessed characteristics as these might take much of the guesswork out of marking for reproduction cuttings.

Method

This study was conducted in a shortleaf-loblolly pine-hardwood stand on the Crossett Experimental Forest. The tract was being managed on a 30-year rotation and had been cut back to seed trees the year the study began. Twenty-nine loblolly pines were selected completely at random from the tree population. The trees ranged from 7.5 to 14.4 inches d.b.h. By the compactness of their foliage, trees were classified into three crown-density groups—sparse, average, and dense. To study the effect of tree size and crown density more closely, an additional sample was drawn to supplement the representative sample, with the aim of obtaining three trees in each of 21 tree size-crown density classes. This involved the selection of 26 additional trees. Even so, two out of 21 possible classes were unrepresented and five were not fully represented. All hardwoods competing with the selected trees were eliminated, by chemical treatment or cutting, to provide optimum conditions for crown development and cone production.

Each tree was given a permanent crown density classification at the beginning of the study. Tree diameter, height, and crown size were also determined at that time. Crown size or volume was expressed in cubic feet and computed by the formula: $V = 0.393\ d^2h$, where d = crown width and h = crown length. This was done on the assumption that each crown approximated a paraboloid, with diameter equal to crown width and height equal to crown length.

Depending on the presence or absence of old cones, each tree was also classified as a "past cone producer" or "past non-producer" when the study was started. The purpose was to investigate the possibility of past cone bearing being an indicator of future productivity. Cone counts were made annually, with binoculars.

Effect of Tree Diameter and Crown Size

The total yearly cone-production trends of the 29 trees in the random sample were very similar to the crop pattern for the entire Crossett territory from 1949 to 1956. Table 1 shows that the best years were 1951, 1952, 1953, and the poorest 1949, 1950, and 1956. Moreover, it is generally believed that loblolly seed trees require about three years to respond to release, and 1951 marked the third year of release for the seed trees.

Multiple regression analyses of cone count on tree diameter and crown volume within each crown-density class yielded correlation coefficients that were not significant. The pooled data for all 55 trees yielded a multiple correlation coefficient that closely approached but did not quite achieve significance.

Figure 1 shows the relationship (based on 29 trees) between cone production and tree diameter alone. Even though the relationship between cone count and diameter fell somewhat short of statistical significance, Figure 1 indicates that trees of larger diameter are better cone producers than smaller trees. The relationship between cone count and crown volume considered by itself was found to be significant (Fig. 2). Crown volume is not easily determined in the field, but tree diameter is, and the correlation between tree diameter and crown size is strong. Thus, when a choice must be made, the selection of a tree of larger diameter almost always assures the marker of a correspondingly larger crown.

Attempts to predict cone production on the basis of tree diameter were not successful. Even though a regression was obtained which expressed the relationship between cone production and d.b.h.,

[1] In cooperation with The Crossett Company, Crossett, Arkansas.

TABLE 1.—CONES PRODUCED BY 29 LOBLOLLY PINE SEED TREES

Year	Trees bearing cones	Total cones	Cones per tree	Cones per bearing tree
		Number		
1949	0	0	0	0
1950	4	18	1	4
1951	23	1,787	62	78
1952	26	4,162	144	160
1953	21	689	24	33
1954	12	270	9	22
1955	20	442	15	22
1956	2	6	0	3

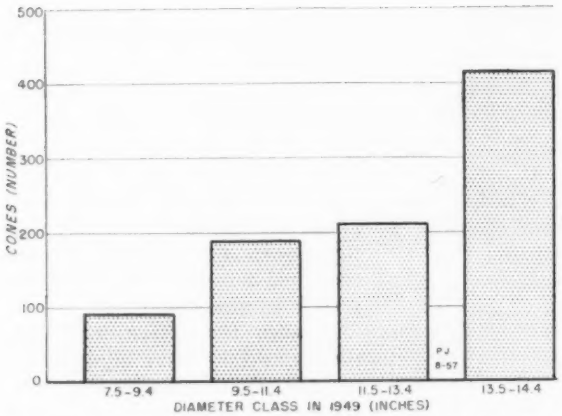

FIG. 1.—Average number of cones produced per tree in eight years, by diameter class.

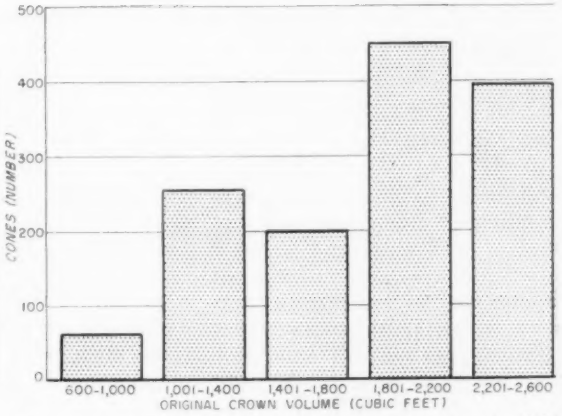

FIG. 2.—Average number of cones produced per tree in eight years, by crown-volume class.

a large standard error of estimate rendered it of little practical use.

Effect of Crown Density and Past Cone Production

Trees with dense crowns were significantly better cone producers than those with average or sparse crowns. Dense-crowned trees averaged 61 cones apiece per year as compared to 29 for the average and 33 for the sparse-crowned trees. The difference in cone production between the average and sparse trees was not significant.

Those seed trees which were originally classified as past cone producers consistently averaged more cones per tree than the past nonproducers (Fig. 3). The ratio of over 3 to 1 in favor of the past producers was highly significant.

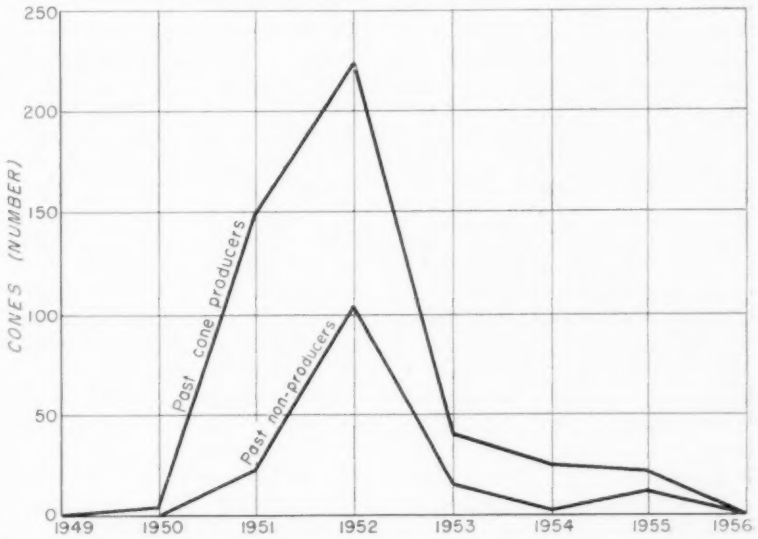

FIG. 3.—Average yearly cone production per tree by past production class.

Conclusions

1. Loblolly pine 12 inches d.b.h. or larger should be chosen for seed trees if available. Smaller trees eventually produce an adequate crop, but cannot be depended upon to restock an area promptly. In this study, the larger trees maintained a decided lead in cone production even after eight years.

2. Seed trees should be selected from those that show evidence of having borne cones in the past. Past cone producers yielded more than three times as many cones in eight years as past non-producers.

3. Trees with large crowns will usually produce more cones than trees with smaller crowns, other things being equal. Because there is a strong relationship between tree diameter and crown size, selecting trees on the basis of diameter automatically takes care of the crown-size factor.

4. Loblolly pines with dense crowns are much better cone producers than those with average or sparse crowns. Cone production of trees with average and sparse crowns is about the same.

Vegetative Propagation of Liriodendron tulipifera[1]

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TAYLOR AND KNIGHT (*1*) suggested in 1927 that attempts to root cuttings of yellow-poplar (*Liriodendron tulipifera*) were impractical because of the resistance of the plant to various treatments. Chadwick (*2*) had some success with untreated cuttings when the basal cut was made one half inch below a node. In 1937 Scholtz (*3*) described the hastening of some root development in summer cuttings treated with indoleacetic acid. Huckenpahler (*4*) reported less than three percent success in rooting yellow-poplar with the aid of a number of auxins. Nelson (*5*) used a method of splitting seedlings longitudinally and then subjecting them to a 16-hour photoperiod to induce further development. Doran (*6*) observed that cuttings which rooted best did not come from the most vigorously growing trees, and he suggests this may be due to a light factor. Also, it has been shown that cuttings taken from the lower branches root better than those taken from the upper branches (*7*).

It is generally agreed that *Liriodendron tulipifera* is extremely difficult to propagate vegetatively. Studies to induce root development in cuttings from the yellow-poplar by a technique and treatment which has proved successful are herein reported.

Materials and Methods

The cuttings used in this investigation were taken from codominant rather than dominant trees, and from the lower branches of those trees. The trees used as a source for the cuttings were 30 years old and older. When the cuttings were gathered the cut was made well back from the portion to be used and then they were processed in the greenhouse. They were taken from lateral twigs and cut to a length of 8 inches. All cuttings were taken from the same parent plants for the duration of the study to avoid genetic differences in the material used. A wound was made on two sides of the cuttings at the base by removing a thin 1-inch slice of bark immediately before treatment.

A well-drained greenhouse bench with sand as the medium was used for the propagation. Intermittent mist was provided by nozzles arranged upright above the sand at regular intervals to provide an even distribution of water. The mist was timed to spray for 8 seconds during each 10-minute time interval from sunrise until sunset.

Cuttings were first taken in June and then at four-week intervals for a period of two months. Beginning with the second week after the cuttings were put into the greenhouse bench, they were examined for root development at weekly intervals.

In each test 50 cuttings were used and they were dipped, for periods of 10 seconds, into solutions of indolebutyric acid and water. The dip concentrations used were 5 mg/ml, 10 mg/ml, and 20 mg/ml.

Results and Discussion

In most cases the foliage discolored and dropped from the cuttings within a few days after their insertion in the greenhouse bench. Shortly after the foliage had fallen new leaves began to develop. None of the plants in the check treatments rooted, nor did they develop callus (Fig. 1, *A*).

Cuttings taken in June rooted in approximately 41 days. None of the cuttings treated with the 5 mg/ml IBA dip rooted. Eight percent of those treated with the 10 mg/ml IBA dip developed roots, and 50 percent of those treated with 20 mg/ml IBA dip produced roots.

Of the cuttings taken in July, only 2 percent were rooted as a result of the 5 mg/ml IBA dip treatment, but 14 percent of the group treated with 10 mg/ml IBA dip rooted, and 60 percent treated with the 20 mg/ml IBA dip rooted. The cuttings taken in July rooted in a period of approximately 46 days.

The percentages of rooting were slightly higher for the cuttings made in August. Again the 5 mg/ml IBA dip did not greatly aid in stimulating root development in the cutting; 8 percent were rooted with this treatment. Twenty percent rooting resulted from the 10 mg/ml IBA dip treatment, and 78 percent were rooted after being dipped in the 20 mg/ml IBA solution (Table 1).

[1]Scientific article No. A647, contribution No. 2834 of the Maryland Agric. Expt. Sta. (Department of Horticulture).

TABLE 1.—ROOTING SCORES OF *Liriodendron tulipifera* TO INDOLEBUTYRIC ACID AS EXPRESSED BY THE NUMBER OF DAYS REQUIRED FOR ROOTING AND THE PERCENTAGE OF ROOTING (50 CUTTINGS PER TREATMENT)

Treatment	Date made	Days to root	Rooted	Remarks
			Percent	
Check	June 20	—	0	Discolored — died
5 mg/ml			0	" "
10 mg/ml		41	8	
20 mg/ml		41	50	
Check	July 16	—	0	Discolored — died
5 mg/ml		—	2	" "
10 mg/ml		46	14	
20 mg/ml		46	60	
Check	August 12	—	0	Discolored — died
5 mg/ml		—	8	" "
10 mg/ml		42	20	
20 mg/ml		42	78	

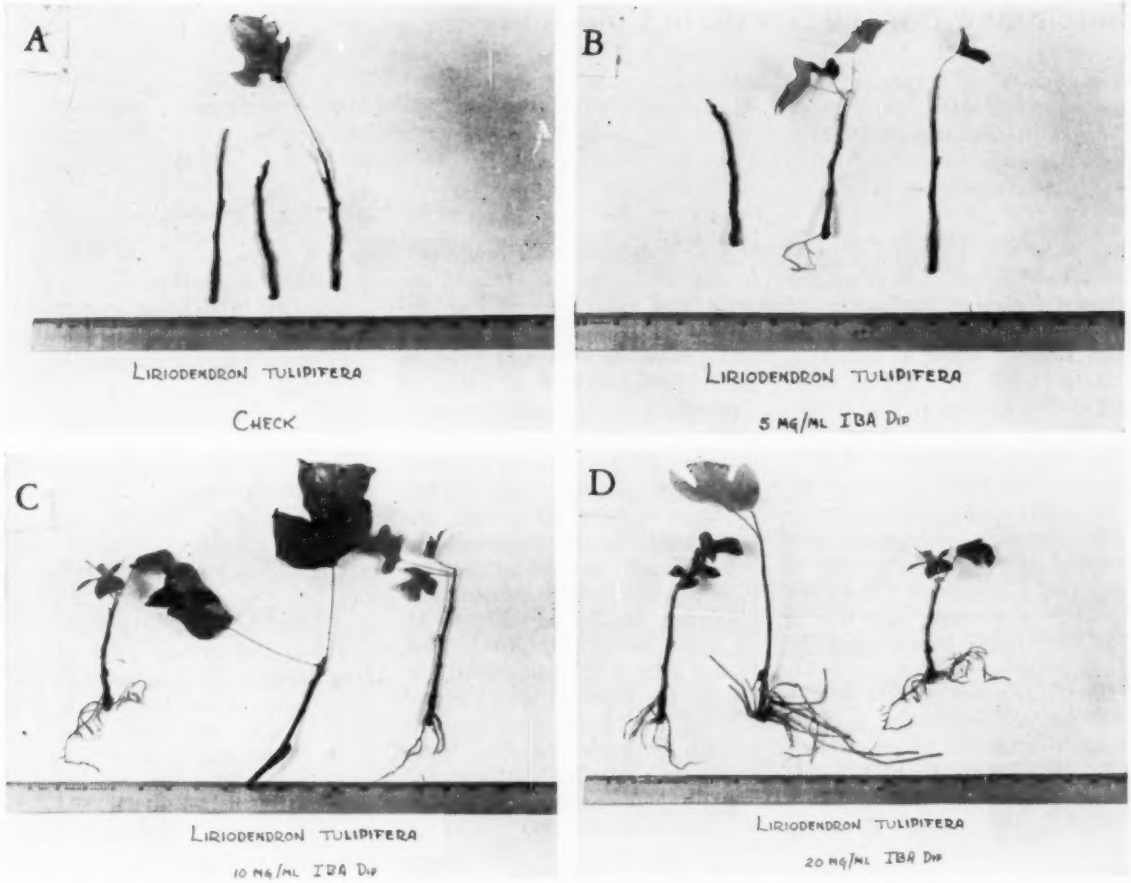

FIG. 1.—Yellow-poplar cuttings showing results of rooting stimulation secured with indolebutyric acid-water treatment. Concentrations are expressed in milligrams per milliliter.

The 5 mg/ml IBA solution, where it proved successful as a rooting stimulant, produced only two or three roots per cutting and these roots were 1 to 1½ inches in length (Fig. 1, *B*). The roots stimulated by the 10 mg/ml IBA dip were produced in numbers of four to eight and were 2 to 3 inches long (Fig. 1, *C*). The longest roots and the greatest numbers of roots were stimulated by the 20 mg/ml dips. In these cases the roots were evident in numbers as great as 17 and they varied in length from 2 ¼ inches to 7½ inches (Fig 1, *D*).

Summary

This investigation indicates that concentrated solutions of indolebutyric acid are of value in stimulating root development in cuttings of *Liriodendron tulipifera*.

It has been further illustrated that concentrations of 10 mg/ml IBA and 20 mg/ml IBA will stimulate root development in rather large percentages and in shorter periods of time than techniques and treatments previously reported.

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Trap Tree Method for Controlling the Engelmann Spruce Beetle in Colorado

R. H. Nagel, David McComb, and F. B. Knight[1]

FIELD TRIALS in Colorado indicate that the trap tree is a promising means of control of the Engelmann spruce beetle (*Dendroctonus engelmann* Hopk.), either as a supplement to chemical control or when used alone. As used in this discussion, the term *trap tree* refers to a living Engelmann spruce of merchantable size felled to attract infestations of the Engelmann spruce beetle. The infested logs can then be milled and the slabs burned or treated with insecticide. The main objective is to decoy the beetles away from living trees during the attack period.

The Engelmann spruce beetle, the most serious insect pest of Engelmann spruce in the United States, is difficult to hold under control because outbreaks develop in wind-damaged stands. For more than a century vast areas of spruce in Colorado have been destroyed by this beetle. From 1939 through 1956 it has killed more than 5 billion board feet of spruce timber in western Colorado. Besides the loss in timber values, this destruction affects the watersheds, wildlife, recreation, and aesthetic resources. Studies begun in 1944 provided the basis for the control project conducted during 1950-1952 in which 1,209,000 infested trees were treated with insecticides.

The trap-tree method is an old procedure for preventing and controlling secondary bark beetle outbreaks in Europe (*1*). One of the early and rather spectacular examples has been cited by Hopkins (*4*). Between 1864 and 1870, in eastern France and in parts of Bohemia and Germany extensive stands of timber were damaged by storms. As a consequence, disastrous outbreaks of *Ips typographus* L. emerged from the broken timber. By 1875, the outbreak was brought under control but not until more than a billion board feet of timber had been barked to destroy the bark beetle broods. Pertinent here is the statement that during the outbreak an estimated 300,000 trap trees were felled to protect living trees against beetle attack by absorbing beetles emerging from infested trees missed during control operations.

The first extensive trap experiments in the United States were conducted in the Black Hills of South Dakota during the summer of 1902 (*3*). Two hundred mature ponderosa pines were used. Groups of ponderosa pines, according to Hopkins, "were felled, hack girdled, girdled to the heartwood, belt girdled, and hacked and peeled at intervals of five or six days between June 2 and October 30. The results of this experiment showed conclusively that no method of preparing the trap trees was of sufficient value in its attractive influence on the Black Hills beetle to warrant its adoption in efforts to control this insect." The beetles attacked many of the trap trees, but the percentage and density of the infestation were no greater than in the healthy trees. On the other hand, Hopkins pointed out that since the western pine beetle could be attracted to girdled and felled trees, it might be desirable to use traps to attract the first generation as a means of maintaining control (*5*). This suggestion led to testing of trap trees in the early development of western pine beetle control by Miller and Keen[2]. From a series of experiments, together with the results from a three-year attempt to employ traps by a California lumber company, Miller and Keen concluded that the method was not practical against the western pine beetle.

First Experimental Results

The first experiments to evaluate trap trees for controlling the Engelmann spruce beetle were begun in 1949 and have been described by Massey and Wygant (*6*). During their studies on the biology of this beetle, they observed that the adults preferred windfalls and sawlogs to living standing trees, which suggested the trap tree study. They found that the beetles attacked the sides and bottoms of the sawlogs, the shaded portions, and the entire bark surface of logs lying in situations with continuous shade. In addition, their investigation revealed that traps absorbed more beetles than the infested standing trees. Standing trees were attacked to an average height of 28 feet and an average diameter of 12 inches as compared with 58 feet and 5 inches for the trap trees.

Beetle Preferences in Field Trials with Traps

Since 1951 the Forest Service has been supplementing chemical control operations with small

[1]Nagel and Knight are entomologists, Rocky Mountain Forest and Range Experiment Station, Forest Service, U. S. Department of Agriculture. The Station maintains central headquarters at Fort Collins, Colorado, in cooperation with Colorado State University. McComb is entomologist, Intermountain Forest and Range Experiment Station, Forest Service, U. S. Department of Agriculture, Ogden, Utah.

The authors gratefully acknowledge the cooperation and assistance from the White River, Arapaho, Routt, San Juan, and Uncompahgre National Forests.

[2]Miller, J. M., and F. P. Keen. Biology and control of the western pine beetle. Unpublished manuscript. California Forest and Range Experiment Station, Berkeley, California. 1945.

groups of trap trees; the first were felled during the fall of 1951. Because of beetle mortality exerted by two seasons of chemical control together with parasites, predators, and physical factors, it was apparent by the middle of the 1952 control season that the beetle population had been greatly reduced. It also became evident that this reduction caused an appreciable increase in the cost for direct control, an effect of the decreasing frequency of infested spruce. This suggested trap-tree trials to concentrate the 1952 flights of adults to accessible localities.

This first field trial was set up to provide information on beetle preference for traps with respect to felling time, type of trap preparation, and stand environment. A total of 3,340 Engelmann spruce were felled in six localities within three national forests as follows:

Locality	No. of traps	Date felled	Trap preparation
White River N. F. (Red Table Mountain)	140	Oct.	With branches
Arapaho N. F. (Elliott Ridge)	75	Oct.	With branches
	875	June	With branches
Arapaho N. F. (Cottonwood Canyon)	375	Oct.	With branches
	375	Oct.	Without branches
Routt N. F. (Buffalo Pass)	1,500	Oct.	8 foot logs

Groups were felled during both spring and fall (1) in the open, (2) exposed to sunlight, (3) in partial shade, and (4) in full shade. The crowns of some trees were left intact; the branches were removed from others. In one logging area the operator agreed to leave 8-foot sawlogs until the beetle flight had ended.

Analysis of the number of egg galleries was begun the first week of August after the termination of beetle flights. A series of currently infested standing trees were felled to provide comparative data. Sample units of bark, 24 by 6 inches were peeled from the top, bottom, and lateral quadrants of the trunk at each 8-foot interval, starting with the first at 5 feet above the root collar and ending with the interval nearest the 6-inch top diameter. Usually, the lateral sample was taken from the north exposure to minimize sampling bark that might be subjected to periods of direct sunlight. The number of egg galleries started in the sample unit by Engelmann spruce beetles as well as those by Ips was recorded. Two sample units were removed from opposite quadrants of each control tree felled for examination. The results of the work in 1952, which were summarized by McComb[3] and by Nagel and McComb[4] are included in this paper in revised form.

Felling Time and Beetle Preference for Traps

Field trials indicate that the beetles preferred the traps felled in the fall. The average number of egg galleries per sample from the traps felled in October 1951 was almost twice that for traps felled in June 1952 (Table 1).

Both groups of traps were less than 10 chains apart in the infestation on Elliott Range (Arapaho N. F.). However, the results, while indicative, are inconclusive because the felling in June was done after the beginning of beetle flight. It was impracticable to do the felling before the flight because the snow blocked access roads. Also, it is recognized that while the two groups were less than 10 chains apart, the June-felled group contained nearly 12 times the number of traps. This could account for the striking two to one ratio.

In subsequent field trials on the San Juan National Forest, the 1952 results were substantiated. Trees felled in the fall of 1954 attracted more beetles than trees felled the following spring prior to beetle flight.[5]

With no evidence to the contrary, it is the tentative conclusion that Engelmann spruce beetles prefer trees felled in the fall. In any event, snow conditions preclude felling in the spring.

TABLE 1.—EFFECT OF FELLING TIME ON ENGELMANN SPRUCE BEETLE PREFERENCE FOR SPRUCE TRAP TREES

Item	Felling time: October	Felling time: June
	Number	*Number*
No. of traps	6	6
No. of samples	56	62
Total no. of egg galleries	940	544
Mean no. of egg galleries	16.8 ± 0.8	8.8 ± 0.5

Difference is highly significant.

Effect of Light on Beetle Attack

Observations and experiments with traps indicate that the Engelmann spruce beetle prefers felled trees shaded by the over-story (Table 2).

The mean number of egg galleries becomes significantly greater with increasing shade, that is, from full sun to partial shade to dense shade, and from top to lateral to bottom positions within a given light exposure.

Beetle preference for trap trees in shaded situations in the 1952 study confirms the results obtained in the 1949 tests. Traps exposed to

[3]McComb, David. The use of trap trees for the control of the Engelmann spruce beetle, *Dendroctonus engelmanni* Hopk. M. S. Dissertation, Utah State Agricultural College, Logan, Utah. 34 pp. 1953.

[4]Nagel, R. H., and D. McComb. The use of trap logs in the control of the Engelmann spruce beetle. Unpublished report. Forest Insect Laboratory, U. S. Dept. of Agric., Fort Collins, Colorado. 1953.

[5]Knight, F. B. Results on trap tree studies, 1953-1955. Unpublished report. 1955.

TABLE 2.—EGG GALLERIES ON TRAP TREES AS RELATED TO SHADE

Light exposure	Samples	Number of egg galleries per quadrant sample: Top	Lateral	Bottom
	Number	*Mean*	*Mean*	*Mean*
Full sun	594	1.9 ± 0.3	11.1 ± 0.6	12.7 ± 0.7
Partial shade	561	3.0 ± 0.4	12.7 ± 0.7	14.3 ± 0.7
Dense shade	588	8.7 ± 0.7	17.8 ± 0.8	18.4 ± 1.0

full sunlight, particularly the top quadrant, tend to loose moisture rapidly. Dry bark and high temperatures caused by full sunlight probably produce an unfavorable environment for beetle development. Consequently, the traps should be felled in well-shaded situations.

Competition from Ips

Competition from *Ips* spp. varied directly with trap exposure to light (Table 3).

Ips seem to prefer the traps in the sunlight to those in the shade, but in either case they prefer the limbed traps. Thus, to minimize competition from Ips, three measures should be used: (1) fell the trees in shade, (2) do not lop, leave the branches, and (3) adjust the time of felling to miss the peak of the Ips flights. Preliminary observations by Thatcher suggest that three flights of Ips occur annually in the spruce forests of Colorado, the first after the middle of June, another in August, and the last during late September.[6]

The attacks recorded for Ips further substantiate previous casual observations and the results of the 1949 studies that sunny bark is preferred (Table 4). Moreover, in full sunlight, the attacks extended to the bottom quadrant in trap trees.

Beetle Preference for Type of Trap

The egg gallery density counts for the Engelmann spruce beetle indicate that there is no preference as between traps with or without branches, provided they lie in shaded situations (Table 5).

[6]Information furnished by Dr. T. O. Thatcher, Department of Entomology, Colorado State University, Fort Collins, Colorado. 1955.

TABLE 4.—RELATION BETWEEN IPS GALLERIES AND BARK EXPOSURE TO SUNLIGHT

Light exposure	Samples	Number of egg galleries per quadrant sample		
		Top	Lateral	Bottom
	No.	*Mean*	*Mean*	*Mean*
Shade	312	3.2	0	0
Full sun	281	10.9	4.3	4.3

TABLE 5.—COMPARISON OF NUMBER OF EGG GALLERIES PER SQUARE FOOT ON LOPPED AND UNLOPPED STEMS

Item	Egg galleries	
	With branches	Without branches
No. of traps	6	6
No. of samples	90	74
Total number of egg galleries	2,252	1,957
Mean number of egg galleries	25.0	26.4[1]

[1]Difference between lopped and with branches is not significant.

In the area where the operator left 8-foot logs exposed to beetles during the entire flight period, the average number of egg galleries was 2.9 per square foot of bark. This low figure is probably an indication that the number of logs was greatly in excess of needs for the beetles in the area. Beetle absorption in the traps was strikingly complete. After considerable search for infested standing trees in the surrounding spruce stands, none were found.

Short sawlogs were undesirable as traps. A high percentage settled into the duff, where the bark was infected by molds. The affected bark was not infested; whether this was due to mold or ground contact is not known.

Beetles Prefer Felled to Standing Trees

Bark moisture, direct sunlight, and height above ground, seem to be chief factors determining bark suitability for the Engelmann spruce beetle. Only in the basal portion of standing trees do densities of egg galleries approach those in trap trees. This relationship is illustrated by some counts for full-bole lengths, shown in Table 6. These densities are based on samples from 12 standing and 24 trap trees.

TABLE 6.—DENSITY AND DISTRIBUTION OF ENGELMANN SPRUCE BEETLE EGG GALLERIES IN STANDING AND TRAP TREES

Sampling height in feet	Egg galleries per square foot	
	Standing trees	Trap trees
	Mean	*Mean*
69[1]	0.0	19.0
61	0.0	30.2±11.7
53	0.0	23.7± 7.1
45	0.0	25.8± 4.0
37	0.04±0.04	25.0± 3.2
29	1.2 ±0.5	24.7± 2.5
21	2.6 ±0.9	21.9± 2.5
13	4.6 ±1.0	24.1± 2.5
5	8.9 ±1.6	24.0± 3.3
(Overall mean)	(2.2 ±0.4)	(25.7± 1.0)

[1]Eight-foot intervals, starting 5 feet above root collar and ending with interval nearest 6 inch top diameter.

In small-scale tests where standing spruce were girdled, Engelmann spruce beetle egg galleries were about as frequent as in ungirdled standing trees. The trial with girdled trees was prompted by the idea that, if effective as traps they could be left to serve as food reservoirs to encourage woodpecker breeding in selected areas, the woodpeckers would eventually consume the beetle populations, thus obviating the need to carry out direct control measures. The girdling experiments were conducted on the Mancos District of the San Juan National Forest in conjunction with a regular trap tree program. Eight of the trees girdled during October 1953 were felled in August 1954, and together with eight felled traps, were sampled at 4-foot intervals. The density and pattern of the egg galleries in the girdled trees were comparable to those shown for standing trees in Table 6. As expected, virtually all of the bark area on the boles of the traps was heavily infested. It is a conservative estimate that the felled traps absorbed ten times as

TABLE 3.—PERCENTAGE OF BARK SAMPLES ATTACKED BY IPS AND ENGELMANN SPRUCE BEETLES AS RELATED TO LIGHT EXPOSURE

Light exposure	Traps	Samples	Percentage of samples attacked by			
			Ips only	E. spruce beetles only	Mixture of both	No. beetles
	Number	*Number*	*Percent*	*Percent*	*Percent*	*Percent*
Shade	18	404	2	91	6	1
Shade (limbed)	6	148	7	78	15	0
Full sun	18	360	12	70	14	4
Full sun (limbed)	6	148	30	30	40	0

many beetles as the girdled trees.

Effective Trapping Distance

Information on the trapping distance of felled spruce is still quite fragmentary. In the case referred to previously, where a logging operator clearcut an area and agreed to leave 8-foot logs exposed to beetle attacks during the entire 1952 flight season, not one infested standing spruce was found during a considerable search in a zone a quarter mile deep about the logging area.

In another study on the Arapaho National Forest the same year, but with untrimmed, full-length spruce trap trees, the trapping effect does not appear so striking. In stands around two trap-tree groups on the Arapaho National Forest, one on Elliott Ridge with 950 traps, and the other in Cottonwood Canyon with 375, exploratory searches soon revealed the presence of infested trees. Whether to measure the effect from the spruce traps in terms of infested trees per acre or egg gallery densities presented a problem for immediate resolution. In each case the results would be affected by the variation in beetle and spruce populations, and by the great differences in the size of spruce trees between one stand locality and another. Because of the limited scope of the 1952 trap-tree study, it was obvious that there was not time to become involved in such relationships, each of which could develop into an impressive statistical evaluation. It was, therefore, decided to limit the measurement to a comparison of the number of infested standing trees by blocks within rectangular plots extending into the undisturbed spruce surrounding the trap-tree groups. The rectangular plots were 132 feet wide and 1,000 feet long. Six plots were arranged more or less equidistant around the periphery of each of the two trap-tree groups, so that their long axes radiated from the approximate center of the groups. Each plot was subdivided into ten blocks 100 feet long with the same width as the plot, and the merchantable spruce inventoried. Block No. 1 in each plot covered the part at the boundary of the trap-tree area to a depth of 100 feet into the undisturbed stand. The outermost block, No. 10, included the portion from 900 to 1,000 feet distance. Since the total number of infested trees per block was quite low, the trees for the respective blocks were pooled for the 12 plots, and are shown in Table 7 on a per acre basis.

In this instance, notwithstanding the large number of trap trees, spruce were infested in the stands surrounding the trap-tree area (Table 7). The average number of egg galleries per square foot was 19, which is believed to be close to the trap saturation for the area. It was, therefore, concluded that the beetle population was greater than the capacity of the trap trees.

There was no correlation between the number of infested standing trees and distance from the trap-tree area. Also, the number of egg galleries per square foot was approximately the same regardless of distance from traps.

TABLE 7.—RELATION OF NUMBERS OF INFESTED SPRUCE TO DISTANCE FROM TRAP-TREE AREA

Distance intervals	Infested spruce per acre	Spruce per acre
Feet	*Mean*	*Mean*
0-100	1.93	72.3
100-200	1.10	78.7
200-300	0.83	72.9
300-400	0.55	74.5
400-500	2.48	65.7
500-600	1.10	74.5
600-700	2.20	58.6
700-800	2.20	51.4
800-900	0.00	26.1
900-1000	0.55	17.1

Dispersal studies with Engelmann spruce beetles in Colorado confirmed the conclusions that felled green spruce are more attractive than standing trees to the beetles, but they added nothing conclusive to the question of trapping distances. Trap trees served very well as sampling points to recover beetles marked with radioisotopes and released.[7] Some tagged beetles were found in traps 3 miles from the liberation point, but the number dropped sharply with the

[7]Nagel, R. H., J. M. Davis, and Bohdan Maksymiuk. Unpublished results from dispersal studies with Engelmann spruce beetles conducted in 1955.

TABLE 8.—ENGELMANN SPRUCE BEETLE EGG GALLERIES ALONG THE BOLES OF TRAP TREES—1954 AND 1955

Area[1]	National forest	Trees sampled	Average d.b.h.	Aver. diam. at the top of infested bole	No. of spruce beetle egg galleries per square foot[2]	Standing trees attacked by spruce beetle within ½ mile radius
		Number	*Inches*	*Inches*	*Mean*	
1. Willow-Fish (C)	San Juan	50	13.5	5.6	3.5±0.8	None
2. Willow-Fish (D)	San Juan	50	18.3	5.2	6.4±0.9	None
3. Flattop	Uncompahgre	35	19.3	3.5	8.3±1.9	None
4. Goat Creek	Uncompahgre	30	19.4	5.7	10.3±2.7	None
5. Soda Creek	White River	20	20.9	7.5	10.9±2.9	None
6. Elliott Creek	Arapaho	20	17.5	5.1	10.0±2.4	None
7. Red Table (A)	White River	25	16.4	3.5	12.2±3.3	None
8. Red Table (B)	White River	25	14.9	3.7	14.6±3.5	Numerous
9. West Beaver	Uncompahgre	25	13.2	6.6	1.5±0.2	None
10. Red Table (A)	White River	21	15.5	3.4	11.0±2.3	None
11. Red Table (B)	White River	50	14.9	3.9	15.3±1.6	Numerous
12. Mancos (A)	San Juan	25	19.7	4.4	10.4±2.1	None
13. Mancos (B)	San Juan	25	17.4	5.4	5.6±1.7	None

[1]Areas 1 to 8 sampled in 1954, 9 to 13 in 1955.

[2]Based upon one 6"x 24" sample per tree taken at random on lateral quadrant. Sampling errors computed at the 5 percent level of accuracy.

increase of the distance.[8] The randomness of flight direction suggests that the beetles make their way through the forests in a meandering pattern. How close they must be to a trap tree to be attracted is still a matter of conjecture.

Applied Trap-Tree Control

During 1954 and 1955 the national forest administration of Region 2 felled trap trees in many of the more serious Engelmann spruce beetle infestations. These operations provided excellent opportunities to observe the effectiveness of traps as a means for direct control. The results are very assuring that in applied control, trap trees are an effective supplemental measure.

The 1954 and 1955 studies were made in 13 areas on four National Forests, the San Juan, the Uncompahgre, the White River, and the Arapaho. Statistics on the sampled traps are given in Table 8.

The data in Table 8 require some explanation so that the results may be properly interpreted. These observations and general comments on specific areas are:

1. Mancos (*A*) traps were cut in the fall of 1954, Mancos (*B*) traps were cut in the spring of 1955 before the flight.

2. The low numbers of egg galleries in Areas 1 and 2 apparently resulted from an over-abundance of trap trees and/or a low population of beetles. No standing infested trees were found within ½ mile.

3. The diameter at height of infestation in Area 5 was large. Many of the trees were felled into a meadow where the tops were in direct sunlight. The beetles avoided the exposed tops.

4. Areas 8 and 11 were the only ones containing numerous standing infested trees within ½ mile of the trap-tree areas. The traps in these areas averaged the largest number of egg galleries per square foot.

5. The traps in Area 9 contained very few egg galleries, and the diameter at height of infestation was large. These traps were in a logging area where there was an excess of host material available. No standing infested trees were found.

The spruce timber surrounding each area was scouted thoroughly. The traps seemed to be effective control measures for ¼ to ½ mile distance. Usually, standing infested trees were found beyond ½ mile.

Trees felled in ample shade generally contained more egg galleries than those cut in the sun.

In general the observations indicate that one trap tree should be felled for every four or five infested standing trees containing beetles of the generation that will attack the traps. These figures are for average conditions of infestation where there is moderate to heavy woodpecked activity. The trap trees can be felled in groups as long as ample shade is left to protect the traps from the sun.

Summary and Conclusions

The problem of protecting Engelmann spruce in Colorado from the Engelmann spruce beetle has been a difficult one. Until natural control factors reduce the beetle populations to an endemic level, major control emphasis is based upon the use of insecticides, supplemented by the use of trap trees.

Although an old practice in Europe for controlling secondary bark beetles, the trap-tree method had been tried in this country against the Black Hills and the western pine beetles without success. The first experiments with traps against the Engelmann spruce beetle in 1949, and trials since then indicate their effectiveness as a supplement to chemical control operations.

The field trials with traps also have shown that under certain conditions they are more heavily infested. For maximum beetle absorption, it would be well to apply these findings: (1) spruce traps felled during the fall were more heavily infested than traps felled in the spring; (2) shady bark was preferred; therefore, traps dropped in well-shaded localities will be most effective; and (3) competition from Ips was minor except in the traps exposed to full sun, but it can be minimized particularly in those from which the limbs were removed.

In general, one trap tree will absorb as many beetles as ten comparable-sized standing spruce. Girdled trees were not effective as traps.

Evidence indicates that trap trees effectively draw beetles ¼ to ½ mile.

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Chemical Control of Chaparral Shrubs in Central Arizona

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REDUCTION OF EXTENSIVE STANDS of chaparral on southwestern ranges and watersheds should produce beneficial results. Land managers recognize that many chaparral shrubs furnish little forage for livestock and use water that might otherwise be available for more palatable vegetation.

Undoubtedly, a portion of the present chaparral type has always supported shrubs, and because of soil characteristics and topography, can be expected to support little else. On the other hand, extensive areas once did, and will still, support perennial grasses, if competition from shrubs can be eliminated or reduced.

Dahms and James have published a comprehensive review of brush control methods.[2] Mechanical, biological, and burning methods have proven effective under certain circumstances. However, continued development of new, more effective chemical herbicides in recent years has focused particular attention on this method. Chemical methods have certain advantages of selectivity, nondisturbance of the site, and wide applicability not characteristic of some of the other methods.

The present study was undertaken to find a chemical method of controlling or eliminating sprouting, broad-leaf, evergreen chaparral shrubs for experimental purposes that would: (1) be effective at all stages of growth, (2) be effective on all species of shrubs, and (3) not disturb the site or harm perennial grasses. The study was carried out on the Sierra Ancha Experimental Forest in central Arizona.

Description of Vegetation

The usual chaparral cover, which characteristically grows in dense thickets on the foothills between the grassland and the forest in the Southwest, is composed of one or two dominants with lesser amounts of one or more secondary species (Fig. 1). Differences in soils, slope, elevation, exposure, and moisture conditions produce variations in stand composition.

Composition of shrubs on the study plots is shown in the following tabulation:

	Crown cover[1]	Stem count[2]
	Percent	*Percent*
Shrub live oak (*Quercus turbinella* Greene)	71.8	83.5
Desert ceanothus (*Ceanothus greggii* A. Gray)	14.1	7.5
Hollyleaf buckthorn (*Rhamnus crocea* Nutt.)	6.9	2.2
Skunkbush sumac (*R. trilobata* Nutt.)	5.4	5.1
Mountain-mahogany (*Cercocarpus montanus* Raf.)	.1	.8
Wright silktassel (*Garrya wrightii* Torr.)	1.3	.4
Others	.4	.5
Total	100.00	100.0

[1]Based on 160 20-foot line transects.
[2]Based on 34,732 live stems.

Total shrub crown cover on the plots varied from 16.1 to 95.1 percent, with an average of 57.9 percent, as measured by line transects before treatment. Maximum height of the shrub stand was 6 feet, and stem diameters varied from 1/8 inch to 4 inches at ground level.

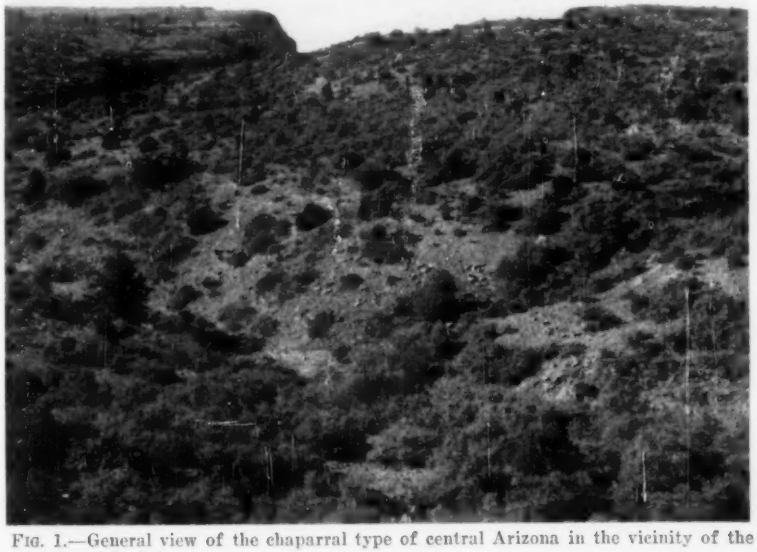

FIG. 1.—General view of the chaparral type of central Arizona in the vicinity of the experimental plots.

[1]Forest Service, U. S. Department of Agriculture with headquarters at Colorado State University, Fort Collins, Colo. Author stationed at Tempe, Ariz., in cooperation with Arizona State College and the University of Arizona.

[2]Dahms, Walter G., and George A. James. Brush control on forest lands. U. S. Forest Serv. Pacific Northwest Forest and Range Expt. Sta. Res. Paper 13. 81 pp. 1955.

TABLE 1.—REACTION OF SEVEN SHRUB SPECIES TO KIND OF HERBICIDE, METHOD OF APPLICATION, AND SEASON OF TREATMENT

Species	Season of treatment	D-T mixture		Ammate		Check[1]
		Basal spray	Painted stub	Basal spray	Painted stub	
		Percent[2]				
Shrub live oak	Growing	75	92	72	206*	146**
	Dormant	64	149	55**	346**	178
Desert ceanothus	Growing	1**	1**	26**	1**	9*
	Dormant	10**	3**	19**	12*	18**
Hollyleaf buckthorn	Growing	28*	345	123	474	711
	Dormant	75	406	97	840*	604
Skunkbush sumac	Growing	27	25	105	119	234
	Dormant	93	63	141	386	200*
Mountain-mahogany	Growing	0	0	---[3]	0	---
	Dormant	5	---	3	30	88
Wright silktassel	Growing	0	---	61	---	---
	Dormant	---	---	---	818	331
Catclaw mimosa	Growing	207	280	---	---	---
	Dormant	210	---	75	---	---
All species	Growing	69*	89	73	197**	143*
	Dormant	62	122	54**	344*	178*

[1]Stems cut off but no herbicide applied.
[2]Numbers of live stems 2 growing seasons after treatment, as percent of original stems (figures include original stems not killed by treatments plus sprouts resulting from treatments).
[3]No plants growing on plots when treated.
*Change from original condition significant at P = .05.
**Change from original condition significant at P = .01.
All other figures either not significant or not suitable for testing.

Methods and Materials

In the first phase of the study the herbicides used were ammonium sulfamate, known commercially as Ammate, and a 50-50 mixture of the butyl ether esters of 2,4-D and 2,4,5-T, popularly known as "Brushkiller." One treatment consisted of painting each poison on the stubs of stems cut off 4 to 6 inches from the ground, hereafter referred to as the painted-stub treatment. For this treatment ammate was used as a 32 percent solution in water and the mixture of 2,4-D and 2,4,5-T, hereafter called "D-T mixture," was used full strength, or 58 percent acid. The second treatment was that of spraying each poison on the lower 8 inches of standing stems, hereafter referred to as the basal spray treatment. For this treatment Ammate was again used as a 32 percent solution in water and the D-T mixture was used as a 5.8 percent solution in diesel oil. Treatments were made in: (1) the winter dormant season (March 9-13, 1953), and (2) the spring growing season (May 5-12, 1953). All of the shrub species were actively producing new stems and leaves at the time of the spring treatment. In addition, plots were laid out on both a fine-textured soil derived from quartzite and on a coarse-textured soil derived from diabase.

For the final phase of the study, the basal spray treatments were repeated with both herbicides during the spring growing season of 1955, two years after the original treatment. However, half of the repeat treatments were switched so that the effect of each herbicide following the other, as well as the effect of two treatments with each herbicide could be evaluated. Thus, half of the D-T plots were treated with Ammate; and the other half, with D-T. Similarly, half of the Ammate plots were treated with D-T, and half with ammate.

The field design consisted of four blocks two on quartzite-derived soil and two on diabase-derived soil) each containing five plots 20 × 80 feet in size. The five treatments applied were the basal spray and painted-stub treatments with each herbicide and one control plot on which stems were cut but no herbicide was applied. Half of each plot was treated when the shrubs were dormant and the other half when the shrubs were growing.

A 2-gallon hand pressure sprayer with T-Jet nozzle No. 8001 was used to apply the basal spray. Stems of all shrubs were sprayed to a height of 8 inches above ground level from at least two sides to insure complete coverage of the circumference of the stem.

For the painted-stub treatment, all stems were cut off within 4 to 6 inches of the ground by small-mouth pruning shears or pruning saw. Immediately, the solution was thoroughly daubed on the stubs, with a paintbrush.

Numbers of stems treated were counted at the ground level and recorded by species for later comparison with numbers of live stems and sprouts.

Effect of First Treatment

Soil effects.—Analysis of the stem count data at the end of the second growing season indicated that soil differences had no effect on treatment results. For this reason, soils were disregarded in the second phase of the study, and the four blocks were considered as replications of the several treatments.

Season-of-treatment effects.—With shrub live oak, season of treatment had no significant influence on effectiveness of the basal spray with either herbicide. For the painted-stub treatment, however, significantly fewer oak sprouts appeared following treatment during the growing season than during the dormant season.

Minor species (desert ceanothus hollyleaf buckthorn, skunkbush sumac, mountain-mahogany, and Wright silktassel) differed widely in their reaction to various treatments. Some treatments caused certain species to sprout prolifically, resulting in large increases in the number of live stems (Table 1). Thus, cutting the stems without applying any herbicide resulted in large increases in the number of live stems of hollyleaf buckthorn and skunkbush sumac. Applying Ammate to the cut stubs of these

species increased the numbers of sprouts still further. Most of the other treatments gave varying degrees of control of sprouting. However, in nearly all cases, application of herbicide during the growing season was more effective in limiting the numbers of live stems two years after treatment than application while dormant.

Method-of-application effects.—With both herbicides, basal sprays were clearly superior to the painted-stub treatment. Of the 22 possible comparisons of relative effectiveness shown in Table 1, basal sprays were superior in 16 cases; painted-stub treatment was superior in 5 cases; and the two methods were equally effective in 1 case.

Although basal sprays were, on the average, superior to the painted-stub treatments, individual species reacted differently within and between treatments. These differences were due in large part to variations in inherent resistance to herbicides and to differences in sprouting ability.

The check plots, on which stems were cut off but no solution was applied, illustrate the variation in sprouting ability between species. Desert ceanothus, the weakest sprouter, produced a minimum of only nine sprouts per 100 stems cut off. Hollyleaf buckthorn was the strongest sprouter, with 711 sprouts per 100 stems cut off (Table 1).

Effect of kind of herbicide.—The D-T mixture gave consistently higher kill (top kill minus sprouting) during the two growing seasons following treatment than the Ammate for each method of application and each season of treatment. The small differences in favor of Ammate basal spray for shrub live oak shown in Table 1 are not statistically significant.

Live stem counts at the end of the first growing season indicated important differences in the action of Ammate and D-T applied as basal spray. The D-T basal spray gave a rapid and almost complete top kill followed by root sprouting (Figs. 2 and 3). Ammate basal spray caused a slow top kill, extending over two growing seasons, and very little sprouting. The two treatments did not differ significantly in total effectiveness, although the live stems on the D-T plots after the second growing season were nearly all highly susceptible young sprouts, while those on the Ammate plots were highly resistant older stems. Applying Ammate to the cut stubs stimulated sprouting on four of the six species, relative to the check plots; whereas the D-T mixture generally suppressed sprouting.

FIG. 2.—Effectiveness of D-T basal spray one year after application.

Effect of Second Treatment

None of the initial treatments, as judged by numbers of live stems and sprouts two years after treatment, was satisfactory for control

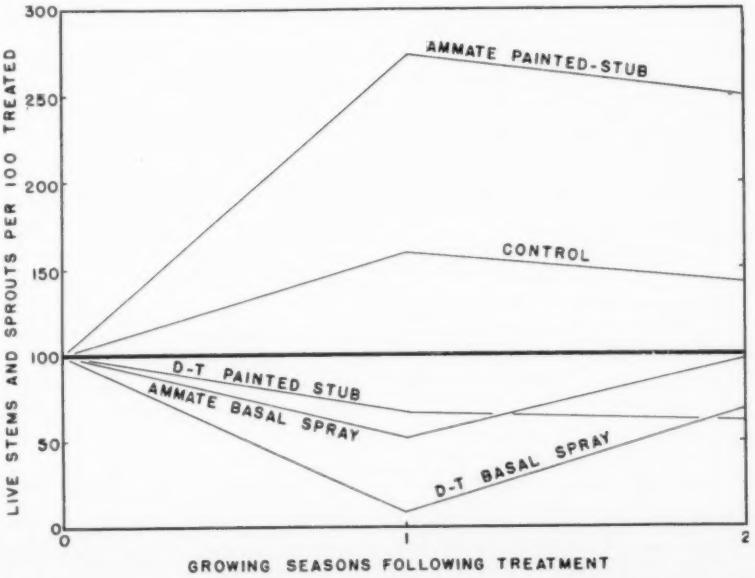

FIG. 3.—Average number of live stems and sprouts of all species one and two growing seasons following treatments per 100 stems treated.

TABLE 2.—COMBINED EFFECT OF TWO BASAL SPRAY TREATMENTS ON SEVEN SPECIES OF SHRUBS[1]

Species	D-T/D-T	Ammate/Ammate	D-T/Ammate	Ammate/D-T
		Percent		
Shrub live oak	−88**	−34*	−67*	−60*
Desert ceanothus	−99**	−95**	−100**	−100**
Hollyleaf buckthorn	−100**	+253	−78*	+77
Skunkbush sumac	−61	+35	−80	−82**
Mountain mahogany	−100	−94	−100	−100
Wright silktassel		−82	−100	−88
Catclaw mimosa	−60	−25	+150	
All species	−88**	−32	−69**	−65**

[1]Figures are percent change from original numbers of live stems at end of second growing season following second treatment, counted at ground level.
*Reduction in number of stems significant at P = .02.
**Reduction in number of stems signficant at P = .01.
All other changes either not significant or not suitable for testing

purposes. Since the basal sprays were, on the average, three times as effective as the painted-stub treatments with both herbicides, only the basal sprays were used for the repeat treatment.

Over-all effects.—The over-all superiority of D-T over Ammate is evidenced by the 88 percent reduction in numbers of live stems with two D-T treatments, compared with the reduction of only 32 percent with two Ammate treatments, for all species combined (Table 2). With combination treatments, D-T followed by Ammate gave 69 percent reduction and Ammate followed by D-T, 65 percent.

Where D-T followed D-T, the second treatment was much more effective than the first treatment: 42 percent reduction for the first treatment against 79 percent reduction for the second treatment (Table 3). However, where Ammate followed Ammate, the second treatment resulted in a 10 percent increase in live stems. Ammate was most effective in small stems, while D-T was effective on stems of all sizes. Thus, where D-T was the first treatment, most of the live stems present at the time of the second treatment were young sprouts, relatively more susceptible. The Ammate treatment following D-T, therefore, resulted in a relatively large reduction of the live stems. On the other hand, where Ammate was the first treatment, larger more resistant stems were left, and the D-T treatment which followed gave much poorer results than, for example, D-T followed by D-T.

Species effects.—Two species, desert ceanothus and mountain-mahogany, were highly susceptible to all combinations of the two herbicides, showing 94 to 100 percent reductions in live stems (Table 2). Wright silktassel was almost as susceptible, with 82 to 100 percent reductions. Also, a single D-T treatment gave almost as good results with these three species as any of the combinations of the two treatments.

Three species, hollyleaf buckthorn, skunkbush sumac, and catclaw mimosa, showed inconsistent reactions to the several treatment combinations. On hollyleaf buckthorn, two D-T treatments killed all stems, but two Ammate treatments stimulated sprouting (253 percent increase in numbers of stems). Skunkbush sumac showed greatest reduction in number of stems (about 80 percent) by the combination of one D-T treatment with one Ammate treatment, but two Ammate treatments increased number of stems by 35 percent. Two D-T treatments reduced number of stems of catclaw mimosa by 60 percent while D-T followed by Ammate produced a 150 percent increase.

With shrub live oak, two applications of the D-T mixture were about two and one-half times more effective in reducing numbers of live stems than were two applications of Ammate. Thus, two D-T treatments gave a reduction of 88 percent as against 34 percent for two Ammate treatments, while combinations of Ammate and D-T gave reductions of 60 and 67 percent.

Changes in shrub crown cover.—Measurements of crown cover provide a more realistic indication for certain purposes, of the effect of treatment on the total vegeta-

TABLE 3.—PERCENT CHANGE IN NUMBER OF LIVE STEMS FOLLOWING INITIAL BASAL SPRAY TREATMENTS AND REPEAT TREATMENTS TWO YEARS LATER[1]

Species	D-T followed by D-T		Ammate followed by Ammate		D-T followed by Ammate		Ammate followed by D-T	
	First treatment	Second treatment	First treatment	Second treatment	First treatment	Second treatment	First treatment	Second treatment
				Percent				
Shrub live oak	−42	−79**	−38**	+6	−20	−58	−36	−37
Desert ceanothus	−86**	−92	−74**	−83**	−98**	−80	−84**	−97**
Hollyleaf buckthorn	−27	−100	+13	+213	−70**	−25	+13	+57
Skunkbush sumac	+68	−77	+13	+20	−78	−7	+30	−86**
Mountain mahogany	−94	−100	−94	0	−100	0	−100	0
Wright silktassel			−9	−80	−100	0	−38	−80
Catclaw mimosa	+110	−81	−25	0	+107	+21		
All species	−42	−79**	−38**	+10	−28*	−57	−36*	−44

[1]Figures are percent change at end of second growing season following each treatment.
*Changes significant at P = .05.
**Changes significant at P = .01.
All other changes either not significant or not suitable for testing.

TABLE 4.—CHANGES IN TOTAL SHRUB CROWN COVER AND NUMBERS OF LIVE STEMS CAUSED BY TWO BASAL SPRAY TREATMENTS

Treatment		Total crown cover		Reduction	
First	Second	Before first treatment	After[1] second treatment	Crown cover	Number of live stems
		Percent			
D-T mixture	D-T mixture	60.31	0.97	98.39**	88.05**
D-T mixture	Ammate	60.82	4.94	91.88**	68.72**
Ammate	D-T mixture	55.91	3.39	93.94**	64.81**
Ammate	Ammate	50.90	23.57	53.69**	32.09n.s.

[1]At end of second growing season following second treatment.
**Reduction from original condition significant at P = .01.

tion cover than do stem counts. In counting stems, a sprout with two leaves receives just as much weight as a full-grown stem.

Line transects were measured before the first treatment and at the end of the second growing season following the second treatment to evaluate the effect of treatments on shrub crown cover. Shrub crown cover dropped 98 percent or more on plots basally sprayed twice with the D-T mixture, while stem numbers dropped 88 percent on the same plots. On plots that received two Ammate basal sprays, shrub crown cover dropped about 54 percent, with a 32 percent reduction in stem numbers as shown in Table 4.

Treatment costs.—Cost records for the experimental basal spray poisoning of all shrubs on 14 acres of mixed grass-shrub vegetation on which shrub crowns covered an average of 21 percent of the ground surface showed per-acre costs of $18.30 for the D-T mixture ($8.32 per gallon), $3.76 for diesel oil ($0.19 per gallon), and $60.00 for labor ($1.50 per hour) for the first treatment. Costs for the second treatment were about half those of the first treatment. Even if costs could be halved without reducing treatment effectiveness, possibly by reducing the concentration of D-T, changing to water emulsion, and economizing on labor, this is definitely a high-cost treatment. Its primary usefulness will probably be restricted to research studies and occasional treatment of unusually high-value, special-purpose areas.

Summary and Conclusions

A plot study was conducted at the Sierra Ancha Experimental Forest in central Arizona to determine the relative effectiveness of Ammate and a 50-50 mixture of 2,4-D and 2,4,5-T in controlling sprouting chaparral shrubs. The two herbicides were applied as basal sprays and by painting on the stubs of stems cut off near the ground. Applications were made while the shrubs were dormant and also while they were growing. Two years after the original treatment, the basal spray treatments were repeated, but switched so that all four combinations of the two herbicides, with regard to chronological order, were obtained. More than 98 percent of the shrub cover on the plots consisted of shrub live oak, desert ceanothus, hollyleaf buckthorn, and skunkbush sumac.

The several shrub species present on the plots exhibited a wide variability in their sprouting characteristics following treatment. Desert ceanothus and mountain-mahogany are comparatively weak sprouters, developing fewer sprouts than the number of stems cut when no herbicide was applied to the stubs in the check treatment, and were easily controlled by all of the herbicidal treatments. At the other extreme, sprouting of hollyleaf buckthorn and Wright silktassel was greatly stimulated by cutting the stems without applying herbicides, and still further stimulated by a single application of Ammate by the painted-stub method (840 and 818 sprouts respectively per 100 stems treated). Sprouting of these two species was effectively suppressed by D-T basal sprays. Sprouting of shrub live oak and skunkbush sumac was stimulated most by the Ammate painted-stub treatment and most effectively suppressed by the basal sprays.

The D-T basal spray applied as a 5.8 percent solution during the growing season was the most effective single treatment on the majority of species. This treatment reduced numbers of live stems by the following percentages: mountain-mahogany, 100; Wright silktassel, 100; desert ceanothus, 99; skunkbush sumac, 73; hollyleaf buckthorn, 72; and shrub live oak, 25.

A second basal spray application of the D-T mixture during the growing season two years after the first treatment improved the total kill (top kill minus sprouting) of the resistant species to the following percentages: hollyleaf buckthorn, 100; shrub live oak, 88; and catclaw mimosa, 60. These kills are considered to be satisfactory for control purposes.

Of the various shrub species comprising the chaparral cover in central Arizona, shrub live oak is the most abundant (60 to 90 percent of the cover) and one of the least desirable. Several of the minor species, including desert ceanothus, hollyleaf buckthorn, shunkbush sumac, mountain-mahogany, and Wright silktassel are valuable browse plants for both deer and livestock.

Since basal sprays are applied to individual stems, the above method can easily be made selective for only those species for which control is desired, such as shrub live oak and catclaw mimosa. Desirable browse species can be avoided in the spraying operation.

Effects of Live Crown Removal on the Growth of Red Pine

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RED PINE (*Pinus resinosa* Ait.) is the most extensively planted tree in the Lake States as well as parts of the Northeast. It is planted primarily for the production of sawtimber. Natural pruning of the planted trees progresses very slowly, and a negligible amount of clear wood will be produced even with rotations of 80 to 100 years (*3*). If high quality sawlogs and clear lumber are primary objectives of management, some form of artificial pruning in plantations will be necessary.

To explore the feasibility of pruning red and white pine in Lower Michigan, a comprehensive pruning study was started in 1950. The cost aspects of pruning red pine were reported by Engle (*2*) in 1952. Methods and recommendations were summarized by Ralston and Lemmien (*5*) in 1956. This paper presents that portion of the study dealing specifically with the effects of live crown removal on the growth of red pine for a 5-year period.

[1]Stationed at East Lansing, Mich., at the Lower Peninsula Research Center. The Center is maintained in cooperation with Michigan State University.

TABLE 1.—SIZE OF RED PINE SELECTED FOR PRUNING, 1950

Plantation	Average total height	Average d.b.h.
	Feet	*Inches*
1	7.1	1.0
2	8.5	1.4
3	9.4	1.6
Average	8.3	1.3
4	15.0	3.0
5	15.0	3.2
6	16.9	3.7
Average	15.6	3.3
7	20.3	4.7
8	26.2	5.1
Average	23.3	4.9

Field Procedure

Five pruning intensities were tested to determine the effect of pruning on height and diameter growth. The treatments included crown removal of 30, 50, 70, and 90 percent of the total tree height. Unpruned trees provided a measure of normal undisturbed growth. These pruning intensities were applied to three general height classes —8, 16, and 24 feet.

Eight red pine plantations located in four western Michigan counties[2] were sampled. Sites ranged from poor to very good. Pruning of the 8-foot height class was tested in each of three plantations. In three others the 16-foot height class was pruned. The remaining two plantations held tests for the 24-foot class. In each plantation five contiguous plots, one for each pruning treatment and a check, were laid out in a random block design.

[2]Manistee, Wexford, Newaygo, and Kent counties.

Each plot was large enough to contain at least 20 crop trees. All of these were pruned but detailed records were maintained only on the first 12 selected. The crop trees selected were straight dominants and codominants without excessively large limbs. They were spaced at least 12 feet apart. Measurements taken at the time of treatment included total height and the diameter at 4.5 feet. Also measured was the height of the live crown before and after pruning. Remeasurements of both height and diameter were made 2, 3, 4, and 5 years after treatment.

The test included 477 trees, 382 of which were pruned and the remainder left as checks. The average tree height and diameter for each plantation under study are presented in Table 1.

Most of the sample trees in each plantation had live branches extending to the ground. Pruning to a fixed percentage of the total height removed about the same percentage of the live crown length. The actual percentages of live crown removed were 30, 48, 69, and 85.

Results

The effects of removing various percentages of the live crown on growth were roughly proportional to the severity of the treatment (Table 2). The 30 and 50 percent crown removals had little effect, but the 70 and 90 percent intensities caused more serious growth losses. In the 90 percent intensity, 30 percent of the trees died.

Five-year losses in height growth due to pruning to 30, 50, 70, and 90 percent totaled 0.4, 0.7, 1.5, and 3.0 feet, respectively (Fig. 1). Correspondingly, 5-year losses in diameter growth totaled 0.0, 0.2, 0.8, and 1.2 inches.

Tree height at time of pruning had no influence on growth loss

TABLE 2.—GROWTH OF RED PINE FOLLOWING PRUNING

Total height percent pruned	1951-52	1953	1954	1955	Cumulative 1951-55
			Height growth in feet		
Unpruned	3.4	2.0	1.7	1.6	8.7
30	3.2	2.0	1.8	1.3	8.3
50	3.1	1.8	1.8	1.3	8.0
70	2.3	1.7	1.7	1.5	7.2
90	1.5	1.2	1.6	1.4	5.7
			Diameter growth in inches (at 4.5 feet)		
Unpruned	0.9	0.4	0.4	0.4	2.1
30	.9	.4	.4	.4	2.1
50	.8	.3	.4	.4	1.9
70	.4	.3	.3	.3	1.3
90	.3	.1	.2	.3	.9

and the rate of recovery. Trees in the 8-foot height class reacted about the same to the various pruning treatments as those in the 16- and 24-foot classes.

The reduction in both height and diameter growth was most severe the first year following pruning. A gradual recovery of growth to the normal rate came with each successive year. Height growth was affected by pruning to a lesser degree than was diameter, percentagewise, and its recovery toward the normal rate was more rapid also.

Height growth recovery was complete for trees pruned to 30 percent by the end of the third year following pruning; those pruned to 50 and 70 percent had recovered by the end of the fourth. The height growth of trees pruned to 90 percent was nearing that of the checks by the end of the fifth year.

There was no reduction of diameter growth for trees pruned to 30 percent. Diameter growth recovery was complete for those pruned to 50 percent by the end of the fourth year. The diameter growth of trees pruned to 70 and 90 percent is recovering more slowly but should equal the growth of the unpruned checks by the end of the sixth year.

The crown positions of pruned and unpruned trees in two plantations of the 16-foot size class were examined 6 years after treatment to determine just how well the crop trees had maintained their dominance. Each sample tree and its strongest competitor were classified according to the Lake States tree classification (*4*) and a comparison made in each case as to which was of greater, equal, or lesser dominance.

The present status of the trees in the check areas indicates that the original selection of crop trees was good, since 88 percent of them are of greater dominance than, or equal to, their strongest competitors and hence in no immediate danger of being crowded out. The critical point in live crown removal for the pruned trees was found to lie between the 50 and 70 percent pruning. Eighty-eight percent of those trees pruned to 50 percent are in strong dominant or near dominant positions, whereas only 33 percent of those pruned to 70 percent have any chance of remaining dominant. Practically all (97 percent) of the trees pruned to 90 percent are subdominant.

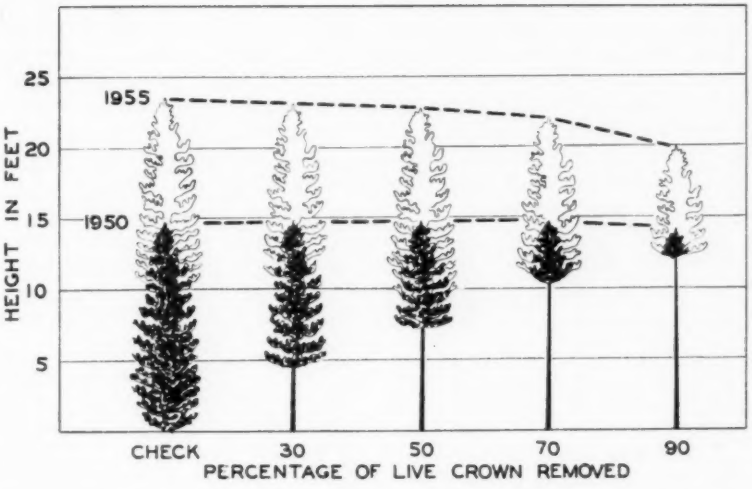

FIG. 1.—Five year height growth of 16-foot-tall red pine following pruning to various intensities.

Discussion of Results

Probably the most practical result of this study is to define more exactly the safe limits of live crown removal by pruning. Pruning recommendations in current use vary considerably as to how much live crown should be removed in any one operation. This study shows that red pine crop trees in plantations averaging 8 to 23 feet in height can be pruned to 50 percent of total height and live crown length without important reduction in growth.

Definite advantages are gained when 50 percent of the crown can be removed in the first pruning. The clearing of an 8-foot or longer log length in one operation is possible since pruning will not start in most plantings until the trees average 16 feet or more in height. More time can be spent pruning and less in travel between trees. Clear salable logs will be produced even when it is not possible to return and extend the pruning upward to a standard 17-foot log length.

Other studies have shown that pruning costs are lowest when a standard log length can be pruned in one operation. Engle (*2*) in Michigan and Bramble and Schmidt (*1*) in Pennsylvania found that pruning to 17 feet in one operation costs less than when done in two or three. Fifty percent pruning will permit the earlier application of one-operation pruning in plantations than more conservative pruning will.

Since pruning is recommended only for the fast growing dominants and codominants, it follows that the degree of pruning should not exceed those limits where height and diameter growth are seriously reduced. If the cost of the operation is to be justified, pruned trees must remain in a dominant position through height growth equal to, or in excess of, that of surrounding unpruned trees. Fast diameter growth is needed for the rapid occlusion of pruned branches, which must precede the formation of clear wood—the primary objective of pruning. Also, healing of pruning wounds is hastened, reducing possible damage to the trees by insects and disease.

The reduction of growth caused by 70 percent pruning is not severe enough to rule out all pruning to

this height. There will be occasional crop trees shorter than the average, which may require pruning beyond 50 percent to obtain a clear 17-foot or other standard log length in one operation. Early thinning will be required, however, to keep trees pruned in excess of 50 percent in dominant crown positions.

Summary

A pruning study utilizing 477 trees was initiated in 1950 to test the effects of live crown removal on the growth of red pine in Lower Michigan. It was found that after 5 years:

1. The removal of 30 percent of the live crown had little effect on height and diameter growth.
2. The removal of 50 percent of the live crown reduced growth slightly for a 3-year period, but the total reduction during recovery was insufficient to rule out 50 percent pruning as a standard recommendation.
3. The removal of 70 percent of the live crown reduced both height and diameter growth sufficiently to rule out this intensity of pruning for use as a general practice. Two-thirds of the trees lost dominance, and early thinning will be required to maintain crop trees.
4. The removal of 90 percent of the live crown of crop trees caused substantial growth reductions, a 30 percent mortality, and almost a complete loss of dominance.
5. Tree height had no apparent effect on growth loss due to pruning and the rate of growth recovery.

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Record of an Old Plantation

These northern white pine (*Pinus strobus*) were planted on either side of a driveway or lane in about 1850. In 1954, when the photograph was taken they were being cut to enlarge a cemetery in Glens Falls, N. Y. The stumps were cut fairly low (12 to 18 inches) and showed a count of 101 rings at stump height.

At the time of cutting, there remained 51 trees in these two rows. Three of them mysteriously disappeared as only 48 of them were cut into logs and scaled. These 48 trees produced 27,700 bd. ft. Scribner scale or an average of 577 bd. ft. per tree at an age of slightly over 100 years. Total heights ranged from 90 feet to 105 feet. Diameters ranged from 15 inches d.b.h. to 30 inches d.b.h. The largest 16 ft. log was 24 inches i.b. small way, small end. The largest 12 foot log was 24 inches and the largest 8 foot log was 27 inches. Logs were cut to a top diameter of 7 inches or 8 inches i.b.

This planting was on a flat sandy terrace about one mile back from the Hudson River at an elevation of about 300 feet.

FRANK S. WARDELL

Notes

A Vacuum Sowing Device for Experimental Nurseries

Many nursery sowings in forest genetics research are made with small lots of seed. The sowing of these small lots is a tedious job if reasonably uniform spacing or a particular number of seeds is desired in a row. After trying several methods, we have devised a simple vacuum counter for sowing.

The experimental nursery at the Georgia Forestry Center, Macon, Georgia, consists of beds 48 inches wide with retaining boards on each side. Twenty-four inches was chosen as the most convenient length for the counter. Two settings of the counter are thus required for each row.

The counter was constructed from a 24-inch piece of electrical conduit tubing, the hose adapter from a vacuum cleaner attachment, and two bottle stoppers. A row of holes 1/16 inch in diameter was drilled down one side of the tubing and the adapter attached to the midpoint of the opposite side. The stoppers were placed in the ends of the tube for cleaning access. The device is operated from a household model canister type vacuum cleaner. A shallow V-shaped trough is used to hold the seed. The trough should be 1 or 2 inches longer than the tube to facilitate rapid pick-up of the seed by sliding the counter along the trough. The fully assembled apparatus is shown in Figure 1.

Seed are placed in the trough and distributed along its entire length. In operation, the counter, with the vacuum operating, is placed in the trough so that one seed is sucked up against each hole. The counter is then checked to remove trash or extra seed at any hole and to place a seed on any empty hole. This can be done very quickly. The counter is then placed in the bed and the vacuum cut off. Slight pressure firms the seeds into the soil and assures their proper spacing. Two men sow each row in 2 operations, one man operating the counter, and his helper on the opposite side of the bed placing labels, spreading mulch, etc.

With small lots of seed, germination percentages are often desired, but the seed may be too valuable to sacrifice a sufficient number for a standard germination or cutting test. The precise count and spacing obtained with this sowing device permit accurate germination figures by seedling count in the nursery.

If several spacings are required, a counter would be needed for each. A wide range of seed size can be handled with one counter having holes 1/16 inch in diameter. The holes should be kept as small as possible to prevent picking up 2 or more seeds at one hole.

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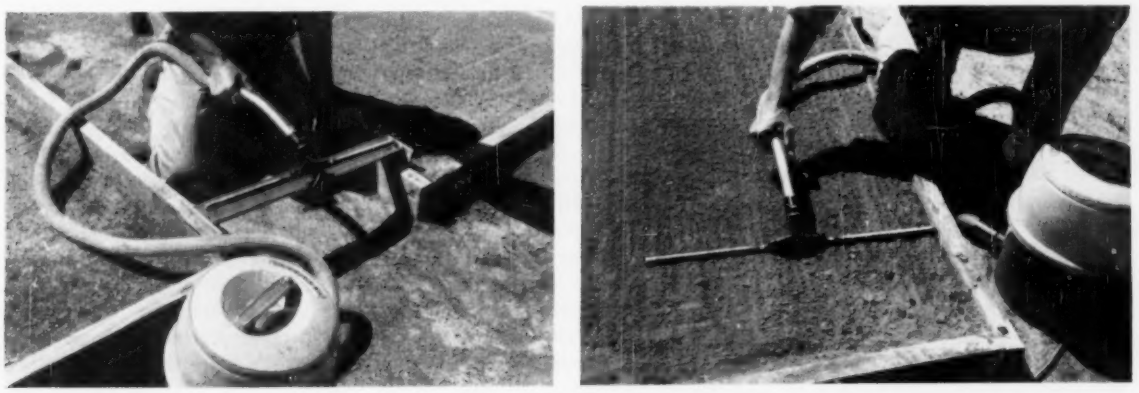

FIG. 1.—The vacuum type seed counter makes it easy to count and space small lots of seed in nursery beds. Seed is picked up at holes in the tube (*left*) and released at the proper location in the seed bed when the motor is shut off (*right*).

Scion Collection with the Rifle

As a part of a forest tree improvement program, it is frequently necessary to collect large quantities of scion material from the upper portion of the crown of trees 70 or more feet in height. For grafting of Southern pines, fresh, vigorous cuttings taken from the upper two-thirds of the crown are recommended for best results. Since selections are generally widely scattered in the forest, one must spend a good deal of time traveling from tree to tree. In order to minimize the total interval of time elapsing between the cutting and grafting of the material, a rapid and inexpensive method of scion collection has been devised. It involves the use of a telescope-sighted varmint rifle in the .218 Bee caliber.

The .218 Bee was first introduced in 1938 in the Winchester model 65 lever-action rifle chambered for that cartridge. The model 43 Winchester bolt-action rifle in the same caliber replaced its lever-action predecessor in 1949 and is presently the only American-made rifle commercially available in the .218 Bee caliber. (Custom conversions and several foreign-made rifles are obtainable in the .218 Bee, however.) The Bee cartridge is a modification of the Winchester 25-20 repeater case and in a factory load uses 46 grain hollow-point .22 Hornet bullets. According to ballistics tables, the factory cartridge with an open-point jacketed bullet has an average muzzle velocity of 2,860 feet per second. Approximate muzzle energy of the bullet is given by:

$$E = 2.22 \times \left(\frac{\text{velocity}}{1000}\right)^2 \times \text{grains}$$

$$= 2.22 \times \left(\frac{2860}{1000}\right)^2 \times 46$$

$$= 835 \text{ foot-pounds}$$

The superior striking force of the Bee is apparent when compared with the ordinary .22 rim-fire cartridge whose muzzle energy is about 120 foot-pounds. Furthermore since it is designed for use on varmints, the Bee bullet fragments readily on contact with solid objects and is not given to dangerous ricochets.

A telescope sight of 4 to 6 power with a medium cross-hair reticule is a definite aid in collecting scion material. The W. R. Weaver Company model K-6 (six power), a rugged, moderately priced telescope, has been found to be satisfactory for the work. Weaver detachable or similar telescope mounts are recommended. After the telescope is mounted, the manufacturers' instructions for focusing and removal of parallax should be followed. "Sighting-in" is best done from the prone position with the forearm of the stock resting on a small sand bag or blanket roll. The "sighting-in" distance should approximate the average height of the selected tree crowns. A two or three inch black square with the center marked by intersecting lines mounted on a white or manila background makes a good aiming point. Since the Bee has a flat trajectory, once the point of impact is established no adjustment of the sight is necessary for the range of tree heights ordinarily encountered in Southern pine selections. It is a good plan, however, to fire a sighting shot periodically to check the alignment of the sights.

While it would appear that the rifle method of scion collection consists merely of choosing a limb, taking a sight, and squeezing the trigger, there are a few useful points to keep in mind.

In the first place, if spectacles are not ordinarily worn, wear shooting glasses. Despite the meticulous care with which modern arms and ammunition are manufactured, there is always danger of a searing gas-leak resulting from a split case or punctured primer.

Second, wear a safety helmet. Limbs adjacent to the "target" may be hit a glancing blow and result in delayed-action felling when least expected.

Third, shoot from a standing position and rest the forearm on a neighboring tree. It is far more dramatic but also less productive in the long run to down limbs from a free-standing position.

Fourth, when using a telescopic sight, align the vertical crosshair in the long axis of the limb. It will be found that in resting the forearm against a tree, there is relatively little sidewise movement.

Fifth, while a greater percentage of hits may be obtained in the morning and afternoon hours because of the stillness of the wind, surprisingly good success may be had during the mid-day by coordinating trigger squeeze with the rythmn of the swaying branches.

Last, but of greatest importance, is the matter of safety in rifle handling. Because of the high angle of fire, the method is not recommended for use within two miles of population centers. The dangerous practice of shooting into the air can be further lessoned by keeping one's self oriented with respect to logging operations and camp sites in the forest.

In order to estimate future ammunition requirements, a shot by shot record was made during the 1956 scion collection season. Production figures based on 151 consecutive shots showed that for collecting slash pine limbs ranging to 5 inches in diameter, 1.9 shots were required per limb. This included outright misses, dislodging shots, and instances where more than one shot was needed to sever a limb. The data also showed that 4.3 usable cuttings were obtained per shot.

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A Technique for Cleaning Increment Borers

The increment borer is an instrument often used only intermittently to make a few borings and then stored or carried for relatively long periods of time before again being used.

In many instances, little or no concern is given to the care of this tool until such time as the securing of readable cores can no longer be accomplished because of deterioration of the borer. One of the main features of this deterioration process is the development of corrosion and the accumulation of debris within the bore of the increment bit. Such corrosion and partial plugging necessitates application of additional pressure in the boring process, thus making the use of this instrument more difficult as well as promoting damage to its cutting and boring edges. This condition can be largely avoided if the increment borer is carefully cleaned following each period of use.

A simple technique of cleaning which has proven successful for the writer consists of treating the auger of the borer as if it were the bore of a gun. A 22-calibre cleaning rod, with a cloth patch and gun solvent, will normally wipe clean any borer which has not become seriously corroded or plugged. The solvent should be removed after the bore is made clean and then replaced with a light film of gun oil. When the bore contains materials which resist removal by this means, a gun brush should be used in conjunction with the cloth patch. The cleaning rod, with its attached gun brush, should be inserted at the handle end of the auger and pushed toward and through the auger opening. The cleaning rod should be of sufficient length to permit removal of the brush prior to withdrawal of the rod from the bore whenever the bore diameter is sufficiently large to permit complete passage of the brush through the auger. A 22-calibre brush, the smallest size obtainable, will normally meet the bore size requirements of most instruments. No difficulty is experienced in selecting brushes to fit over-size bore diameters, a 30-calibre occasionally being required. Many of the shorter increment borers, however, have augers whose inside diameters are too small to easily receive the minimum size brush of 22-calibre, especially near the cutting end of the borer. This situation can be met in one of three ways: (1) by using a bristle brush which is very flexible and will pass more readily through the smaller borers than will one constructed of wire; (2) by using old wire brushes which are of smaller diameter than when new due to wear through use in cleaning firearms; or (3) by cutting or grinding a new wire brush down to the size of the instrument bore. A quick and efficient way of doing this is to turn the brush into the bore from its cutting end, thus cutting the brush down to the exact bore size.

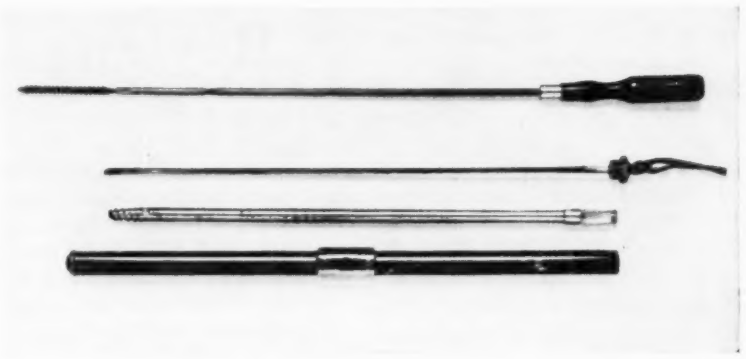

FIG. 1.—Twelve-inch increment borer with cleaning rod and brush

A commercial hand-gun cleaning rod can be purchased for use with short increment borers. Longer borers can be cleaned with a three-section rifle cleaning rod by removing the middle section and attaching the remaining sections to each other. One-piece rods can be cut to any desired length and a broken sectional rod, no longer usable for cleaning rifles, can often be made into an excellent cleaning rod for increment borers. Figure 1 shows such a rod constructed from a three-section 22-calibre rifle cleaning rod which through excessive use has become inadequate for its intended purpose. This conversion was accomplished merely by removing the handle from its original section and attaching it to the tip section of the rod.

Other parts of the increment borer should not be slighted in the cleaning of this instrument. The exterior surface of the cutting end of the borer is also susceptible to corrosion and should be wiped clean and oiled. The core remover, particularly, should receive special attention at the time of cleaning in order to prevent corrosion and to encourage easy removal of cores from the auger's bore.

Once equipped with a suitable cleaning rod, brush, and other cleaning materials found in any sportsman's gun cabinet, it is a quick and easy procedure for a forester to maintain the bore of this essential forestry tool in as good condition as he would his preferred shotgun, rifle, or handgun. Such maintenance will greatly enhance the usefulness of the increment borer as well as to substantially increase its longevity.

HERSCHEL G. ABBOTT
University of Massachusetts

Reviews

Soil: The Yearbook of Agriculture 1957

784 pp. Illus. U. S. Department of Agriculture, Washington 25, D. C. 1957. $2.25.

Traditionally a best seller of the U. S. Department of Agriculture, the 1957 Yearbook entitled "Soil" already seems headed for success. Released on September 22, 230,850 copies of this newest member of the familiar annual series are available to citizens. Forest land managers will welcome this comprehensive reference book which is devoted to the principles of soil management.

The book's 784 pages are written by 142 authors, assembled into 88 chapters under 8 major headings—principles, fertility, practices, soil care, moisture, systems, regions, and special uses. Its popular parent, *Soils and Men*, the 1938 Yearbook of Agriculture, sounded a stern warning that "no man has the right to destroy soil even if he does own it in fee simple." The present book briefly repeats this warning, and then goes on to describe the knowledge about soils that has been gained during the past 20 years. Alfred Stefferud, editor of the 1957 Yearbook, calls it "a new and adapted variety of *Soils and Men*."

Chapters of special interest to foresters are entitled "Soil Management for Forest Trees, Shelterbelts and Windbreaks, Soil and the Growth of Forests, and Forest Practices and Productivity." These 41 pages are replete with recent information and concepts pertinent to silviculturist, forest ecologist, and forest hydrologist. Then too, the forest soils specialist will want to study the pages in many other chapters. Others, seeking answers to questions they may have about forest soils, should find answers by referring to selected chapters. Those desiring general information about soil management problems and opportunities within a given region will enjoy the material presented for each of 16 distinctive regions in the United States. Unfortunately, the introductory section to this portion of the book does not contain an index map showing the location of these regions by name.

An excellent glossary of terms is given on 20 pages, together with an index and list of scientific names. Although only 16 photos are included, there are numerous graphs, charts, tables, maps, and line drawings throughout the book.

Congressional printing allots 550 copies to each senator and 440 to each representative. Persons unable to obtain free copies from some member of Congress can buy one from the Superintendent of Documents, Government Printing Office. The chapters on home gardens, lawns, ornamental plants, and vegetables in themselves make a fine gardening book worth twice the price.

PETER W. FLETCHER
University of Missouri

Soil-Plant Relationships

By C. A. Black. 332 pp. Illus. Wiley & Sons, Inc., New York. 1957. $7.

This new contribution to the American literature on soils is intended for students who already have attained some knowledge of soil, plant physiology, and the basic sciences at the undergraduate level. The subject matter is arranged in the following nine chapters: 1. Soil Composition, 2. Soil Water, 3. Soil Aeration, 4. Exchangeable Bases, 5. Soil Acidity, 6. Soil Salinity and Alkalinity, 7. Nitrogen, 8. Phosphorus, 9. Potassium.

The outstanding merit of this book is the frank admission by the author of our ignorance of many details pertinent to physical and chemical characteristics of soils. Dr. Black does not hesitate to state that his discussion of soil reaction is made without an exact definition of acid soil. Similar statements are made in reference to other factors. Dr. Black accomplished good and honest work, and his monograph deserves straight-forward criticism.

Some ecologically-minded students are likely to disagree with the title of the book. It is essentially a text on soils, written with emphasis on physico-chemical aspects of soil behavior. It does not deal with plant relations any more than do other similar texts. When the term "Soil-Plant Relationships" is used, it is assumed that the subject matter covers the influence of soil on plants of different species, for no one can generalize the relationship between soil factors and crops of entirely different requirements, such as corn, potatoes, and pineapples. "Soil as a Medium for Plant Growth" might have been a more appropriate title.

The page cover of the book carries the inscription, "A thorough, integrated analysis of the major soil-plant relationships with stress on basic, practical factors." This statement may or may not help the publisher in the distribution of the text, but it is definitely unfair to the author. The author should be in a more advantageous position to let his professional colleagues judge whether or not the book is a thorough, integrated analysis which considers basic factors, or otherwise. Actually, the book does not need a high pressure type of advertising.

One of the serious shortcomings of the book is its consideration of only the three nutrient elements of the agricultural triad (NPK), and inadequate treatment of other elements which are undoubtedly basic factors of practical importance.

Dr. Black is a professor of soils in Iowa, a state which provides a considerable part of our daily bread, and he made no effort to trespass on lands dedicated to timber production. Nevertheless, serious students of forest environment would be benefited by many pages of his work.

S. A. WILDE
University of Wisconsin

Smoke Over Sikanaska

By John Stafford Gowland. 224 pp. Illus. Ives Washburn, Inc., New York. 1955. $3.50.

The life of a forest ranger is usually considered glamorous and is frequently so depicted in motion pictures and fictional accounts. It is a pleasure therefore to have a well-written, first hand account of the experiences of forest ranging in the Canadian Rockies, from the pen of an observant member of the Forest Service.

Parts of the Canadian Rockies still have the advantage of retaining some methods of travel used by the pioneer. Its forests, and the game preserves, (the latter almost untouched) give the modern traveller a feeling of being in the mountain wilderness, which had such a deep fascination for early travellers and settlers. When this high sanctuary is described in moving and appropriate terms, without sentimentality, the public is treated to a word picture seldom seen from this perspective.

The author, Mr. J. S. Gowland, came to Canada after World War I. During the next two decades, he lived as a rancher, and later as a forest ranger, in the territory known in Alberta as the "east slope" of the Rockies. His experiences would be comparable to those of other Canadian forest rangers, from Glacier Park on the International boundary to the rugged country east of Jasper National Park in the Clearwater and Brazeau forests. In fact, some postions read like an anthology of several rangers' lives in one.

From the forest protection standpoint, descriptions of the work involved in fighting small and large forest fires, with all the attendant labor, danger, and destruction of natural resources, make the most effective material in this well-written volume.

Dedicated forest rangers view with bitterness any casual (or deliberate) violation of forest fire prevention regulations. This reaction is echoed by all Forest Service officials who have to combat the threat caused by a comparatively small percentage of the travelling public. On the pleasant side is the author's tribute to the great bulk of the forest visitors, and his high admiration for the ranger and forest administration staff with whom he came in contact.

Several dramatic chapters are contained in this book, notably the one where the new assistant is alone in a lookout cabin on top of a bare mountain. An intense electrical storm and the terrific winds which follow this disturbance are a real initiation. Another narrow escape is recorded when the author fell through thin ice on a mountain lake in sub-zero weather, while completely out of reach of assistance. His ingenuity in escaping from this predicament makes fascinating reading. The incident above occurred during a winter-long period of isolation, spent apprehending fur-poachers in a game preserve in the Canadian Rockies.

A nice balance is struck by this author between dramatic highlights, such as those indicated, and the routine but necessary daily work of the forest ranger. This gives the book a quality which will be appreciated by professional foresters, and forest rangers, who are frequently annoyed by inaccurate descriptions of the Forest Service and of forest ranger work. Writers who are not qualified technically, or those inexperienced in the work of these devoted public servants, seem to outnumber authors of Mr. Gowland's caliber.

This book could serve to describe some ranger districts in the U. S. Rockies, but to old-timers from Calgary, the name Sinanaskis is easily recognized as Kananaskis, near Banff, Alberta. The major characters are likewise realistically portrayed. The chief portrait which emerges, however, is that of the isolated, dependable, hard-working ranger, who still has the soul and the imagination to look around periodically, and thank a kind providence for the woodland world in which his pleasant lot is cast.

J. L. VAN CAMP
Canadian Forestry Association

Publications of Interest

The Office of Industrial Resources, ICA, has recently published a 96-page booklet entitled *A Small Sawmill Enterprise*, written for those wishing to establish small sawmill businesses in foreign countries. It deals with both the mechanical and business aspects of conversion of logs into lumber. Copies may be obtained from the International Cooperation Administration, Washington 25, D. C.

* * *

In 1925 the Maryland Forestry Association sponsored a Big Tree Contest and from the 450 entries submitted a list was compiled and has been kept up to date ever since. Former Maryland State Forester Fred W. Besley has collected into a booklet, *Big Tree Champions of Maryland*, a record of some of the largest trees in the state. Forty of the 63 pages in the booklet are devoted to pictures of the trees. For copies write to Maryland Department of Forests & Parks, State Office Building, Annapolis.

* * *

Forestry by Nelson C. Brown is number 8 of the series of Vocational and Professional Monographs published by the Bellman Publishing Company, Cambridge 38, Mass. A brief history of American forests and forestry introduces the reader to a discussion of the importance of forests to national economy and welfare. The nature of forestry is then covered, after which the major portion of the 31-page bulletin is devoted to a discussion of its vocational aspects. Priced at $1, this monograph is prepared for use in connection with vocational guidance counseling work or for the individual student seeking information on forestry as a career.

Current Literature

Compiled by MARTHA MEELIG, *Librarian, State Uniiversity College of Forestry at Syracuse University Range Management Section Complied by Division of Bibliography, Library, U. S. Department of Agriculture*

General

Australian Tree Portraits. By C. P. Mountford. 69 pp. Illus. Cambridge Univ. Press, New York. 1957. $8.50.

Descripciones de Arboles Forestales No. 1 Swietenia Macrophylla *King.* By Federico Bascopé, A. L. Bernardi and Hans Lamprecht. 18 pp. Illus. Instituto Forestal Latino Americano, Merida, Venezuela. 1957. Mimeog.

Plant Doctoring Is Fun. By Cynthia Westcott. 256 pp. Illus. Van Nostrand, Princeton, N. J. 1957. $4.50.

Swamp Life; an Almanac. By Glen Rounds. 128 pp. Illus. Prentice-Hall, New York. 1957. $3. Ages 10 up.

Trees and Shrubs for the Southern Coastal Plain. By B. E. Wigginton. 160 pp. Illus. Univ. of Georgia Press, Athens. 1957. $2.50.

Trees and Shrubs of the Upper Midwest. By C. O. Rosendahl. 141 pp. Illus. Univ. of Minnesota Press, Minneapolis. 1957. $6.

Conservation

Conservation; An American Story of Conflict and Accomplishment. By D. C. Coyle. 284 pp. Illus. Rutgers Univ. Press, New Brunswick, N. J. 1957. $4.

Forest Products

Charcoal Production in the United States. 14 pp. Map U. S. Forest Serv., Div. of Forest Economics. 1957.

Guides to Manufacturing and Marketing Charcoal in the Northeastern States. By F. C. Simmons. 20 pp. Illus. Northeastern Forest Expt. Sta., Upper Darby, Pa. 1957. Station Paper No. 95.

A Marketing Information Primer for Woodlot Owners. By H. S. Mosebrook. 12 pp. Illus. McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles, Calif. Reprinted from American Forests, May 1957.

Price Trends and Relationships for Forest Products. By U. S. Forest Service. 58 pp. Washington 25, D. C. 1957. 85th Cong., 1st session, House Doc. 195.

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Världens Framtida Virkesförsörjning (World Timber Trends and Prospects) English summary. By T. Streyffert. 258 pp. Royal School of Forestry, Stockholm, Sweden. 1957. Bul. No. 27.

Logging and Milling

Pulpwooding with Less Manpower. By Sam Guttenberg and J. D. Perry. 34 pp. Illus. Southern Forest Expt. Sta., New Orleans. 1957. Occasional Paper No. 154.

Pathology

Elms Killed by Dutch Elm Disease Spoil Village Beauty. By R. W. Nash, John Chadwick and Douglas Stark. 19 pp. Illus. Maine Forest Serv., Augusta. 1957. Bul. No. 16.

Protection

Annual Report of the Forest Insect and Disease Survey 1956. 95 pp. Maps. Canada Dept. of Agric., For. Biol. Div., Sci. Serv., Ottawa. 1957.

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Entomological Aspects of the 1955 Southern Idaho Spruce Budworm Control Project. By M. M. Furniss. 22 pp. Illus. Intermountain Forest and Range Expt. Sta., Ogden, Utah. 1957. Misc. Pub. No. 10. Mimeog.

Entomological Phases of the 1955 Montana Spruce Budworm Control Project. By H. R. Dodge, T. T. Terrell and P. C. Johnson. 12 pp. Intermountain Forest and Range Expt. Sta., Ogden, Utah. 1956. Misc. Pub. No. 9. Mimeog.

Forest Insect Conditions in the Intermountain & Northern Rocky Mountain States During 1956. 6 pp. Intermountain Forest and Range Expt. Sta., Ogden, Utah. 1957. Misc. Pub. No. 11.

Silviculture

Black Spruce Reproduction on Disturbed Soil Conditions. By André Lintern. 14 pp. Canada Dept. of Northern Affairs and National Res., For. Res. Div., Ottawa. 1957. Tech. Note No. 54.

Christmas Tree Growing in Canada. By W. M. Stiell. 21 pp. Canada Forestry Branch, Ottawa. 1957. Misc. Pub. No. 7.

Cutting and Seedbed Preparation to Regenerate Yellow Birch, Halliburton County, Ontario. By J. M. Jarvis. 17 pp. Illus. Canada Dept. of Northern Affairs and National Res. 1957. Tech. Note No. 53.

Field Procedures for Soil-Site Classification of Pine Land in South Arkansas and North Louisiana. By Robert Zahner. 17 pp. Southern Forest Expt. Sta., New Orleans. 1957. Occasional Paper No. 155.

Forest Tree Planting . . . Here's How in the Redwood-Douglas Fir Region of California. By D. F. Roy. 31 pp. Illus. California Forest and Range Expt. Sta., Berkeley. 1957. Misc. Paper No. 20.

Influence of the Aspen Overstory on White Spruce Growth in Saskatchewan. By J. H. Cayford. 12 pp. Canada Dept. of Northern Affairs and National Res., For. Res. Div. 1957. Tech. Note No. 58.

Silvical Characteristics of Eastern Redcedar. By M. J. Williamson. 14 pp. Illus. Central States Forest Expt. Sta., Columbus, Ohio. 1957. Misc. Release No. 15.

Silvical Characteristics of Sand Pine. By R. W. Cooper. 8 pp. Illus. Southeastern Forest Expt. Sta., Asheville, N. C. 1957. Sta. Paper No. 82.

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The Tolerant Hardwood Forests of Northern Nova Scotia. By M. H. Drinkwater. 25 pp. Illus. Canada Dept. of Northern Affairs and National Res., For. Res. Div., Ottawa. 1957. Tech. Note No. 57.

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Mechanical Properties of Ponderosa Pine from the Black Hills. By J. T. Drow, A. W. Dohr and S. Bellosillo. 8 pp. Illus. U. S. Forest Products Lab., Madison, Wis. 1957. Rept. No. 2090.

Tension Wood in Overcup Oak. By H. E. Wahlgren. 6 pp. Illus. U. S. Forest Products Laboratory, Madison, Wis. 1957. Rept. No. 2089.

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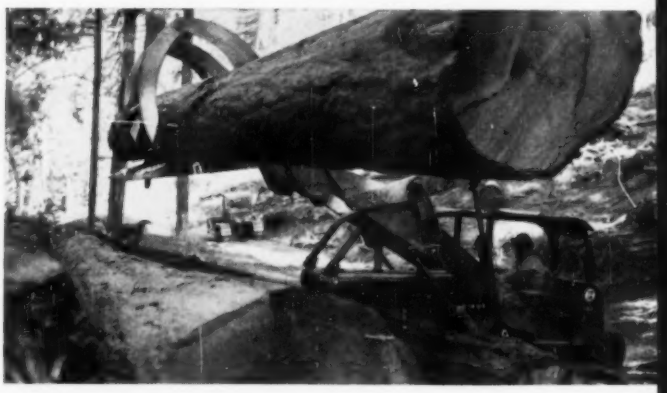

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The President's Column

DEWITT NELSON

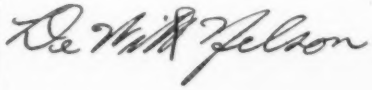
Two years ago this month I wrote my first President's Column. I wrote it within an hour after learning of my election. I was pleased and proud to have been elected president of the Society of American Foresters. Today, after two years and 24 columns I have an ever greater appreciation of the Society, the profession, and the men who have dedicated their lives to the principle that our natural resources must be intelligently managed and wisely used.

Recent years have seen great strides of accomplishment in American forestry—whether it be in the North, South, East, or West. Many factors have contributed to this growth, and with it have grown the opportunities and responsibilities of the foresters. The Society and its 11,600 members represent more than a half century of unified, concerted effort toward common goals and a record of achievement and contributions of which we can all be proud. The Society's strength lies not in conformity of opinion as to means, but in agreement as to goals.

For me this has been a rich and rewarding two years. To the Council, staff, and membership who have contributed so generously—thank you. To the ranger in the north woods of Minnesota, to the service forester in Louisiana, to the cord wood buyer in Maryland, and to the gyppo operator in the West who have responded to my columns I express my gratitude.

Next month we will have a new set of well qualified officers and Council. To them we must renew our pledge of loyalty and service. Next year the Society and the profession will have new problems and new opportunities. May we all measure up to the task ahead.

Again, thank you for the privileges and opportunities you have given me.



Central States Section 1957 Annual Meeting

The 35th Annual Meeting of the Central States Section was called to order at 7:30 p.m., October 3, at the Ly-Mar Hotel, Herrin, Ill. Chairman C. S. Walters presided. Eighty-three members were present, including charter member Robert Craig of Ann Arbor, Mich.

After several standing committee reports, W. R. Boggess gave the report of the Revision of Section By-Laws Committee. In the discussion of Boggess' report which followed, the members present agreed generally with the changes recommended by the committee, particularly the provision for voting for officers by mail, but desired the committee to revise the recommended By-Laws slightly. No action was taken.

Chairman Walters brought up the subject of the establishment of additional Schools of Forestry in the Central States. After a brief and pointed discussion, L. E. Sawyer moved to table the matter. He was seconded by Byron Clark.

C. I. Miller presented a resolution concerning the late Dr. E. R. Martell, who was head of the Department of Forestry and Conservation, Purdue University, Lafayette, Ind. This resolution was passed.

In accordance with the Section By-Laws, Vice-Chairman C. I. Miller was automatically advanced to chairman. In the election held at the meeting to fill offices to be vacated, Robert Paton, forester, Ohio Forestry Association was elected vice-chairman and J. C. Callahan, Purdue University, Lafayette, Ind., was elected secretary-treasurer.

Wisconsin-Michigan Fall Meeting

"Multiple Interests in Lower Michigan Forest Land" was the timely theme of the semi-annual meeting of the Wisconsin-Michigan Section at Manistee, Mich. More than 130 members attended the banquet and meetings held September 19 and 20. This was the first section meeting held in Michigan's Lower Peninsula since the Lower Michigan Chapter joined the Wisconsin-Michigan Section three years ago. Presiding over the meeting was John Macon, chairman of the Section. Secretary of the Section for the current year is Donald Prielipp.

Gordon B. Bonfield, vice-president and general manager of the American Box Board Company and chairman of the Michigan Forest Industries Information Committee, was the principal speaker at the convention's evening banquet. Mr. Bonfield hailed the forestry profession as tremendously important in the nation's present and future economy, stating that our greatest renewable resource is at the command of foresters. "It is up to the foresters to sell the need for scientific forest management, if we are to realize the full potential of our tremendous forest resource," declared Mr. Bonfield.

Discussions on the conference theme included topics led by M. B. Dickerman, director, Lake States Forest Experiment Station; Harry D. Ruhl, chief, Game Division, Michigan Department of Conservation; Robert Dodge, regional supervisor, Parks Division, Michigan Department of Conservation; Knight D. McKeeson, assistant secretary, Michigan Tourist Council; Norman Smith, forester-in-charge, Research and Surveys, Forestry Division, Michigan Department of Conservation; Louis Pommerening, forest supervisor, Lower Michigan National Forest; Russell H. O'Neil, chief forester, Forestry Division, Consumers Power Company; Rowland W. Blair, chairman, Michigan Tree Farm Committee; and Casey E. Westell, forest and wildlife ecologist, American Box Board Company.

In charge of arrangements for the two-day program were Rowland W. Blair, chief forester for the American Box Board Company; Louis Pommerening, forest supervisor for the Lower Michigan National Forest; and John Arend, forest research center leader for the Lake States Forest Experiment Station.

The next semi-annual section meeting will be held in Milwaukee, Wis., sometime in February or March.

Dues Deductible

In filing U. S. income tax reports, all members may classify dues paid to the Society of American Foresters as deductible expenses.

Dues for 1958 should be paid promptly and in no case should they remain unpaid after June 30, 1958. Members whose dues are not paid by that date become delinquent and will receive no further issues of the JOURNAL OF FORESTRY until dues are paid.

Inactive Status

Society members temporarily serving in the armed forces may request that they be placed on inactive status. Inactive members do not receive copies of the JOURNAL OF FORESTRY, nor are they permitted to vote. They are considered as members of the Society and may be restored to active status upon request, when returning to civilian life, with payment of current dues only.

Retired Status

Members and Fellows of 20 years or more standing who retire from full-time employment, either in forestry or other fields, with consequent substantial reduction in income, may, upon application to the Council, continue as voting members. Their dues are remitted except for an annual charge of $5 should they desire to receive the JOURNAL OF FORESTRY and other Society publications.

Members granted such retired status in the Society must continue to pay Section dues in order to continue as Section members.

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AND USE IT FOR BOUNDARIES TOO!

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SCHOOL BOX SCORE 1957 MEMBERSHIP

School	Student Applications Received Dec. 1957	Total 1956	Total 1957
Alabama Polytechnic Institute	0	6	19
University of California	20	53	30
Colorado State University	3	28	19
Duke University	9	7	13
University of Florida	0	25	6
University of Georgia	21	30	86
University of Idaho	4	21	19
Iowa State College	17	31	35
Louisiana Polytechnic Institute	7	27	18
Louisiana State University	22	22	41
University of Maine	13	13	31
University of Massachusetts	6	20	10
Michigan Coll. of Mining & Tech.	29	0	29
Michigan State University	15	50	24
University of Michigan	5	24	14
University of Minnesota	1	26	28
University of Missouri	26	2	62
Montana State University	0	17	45
State University of New York	1	38	25
North Carolina State College	35	24	36
Oregon State College	0	44	29
Pennsylvania State University	2	35	32
Purdue University	16	36	18
Utah State University	0	28	5
University of Washington	11	21	27
West Virginia University	0	5	19
Yale University	2	13	7
Totals	265	646	727

SECTION BOX SCORE 1957 MEMBERSHIP

Section	Applications Received[1] Dec. 1957	Total 1956	Total 1957
Allegheny	3	58	68
Appalachian	45	58	71
Central Rocky Mountain	3	32	24
Central States	18	42	30
Columbia River	1	77	55
Gulf States	31	79	84
Inland Empire	4	32	21
Intermountain	0	35	6
Kentucky-Tennessee	1	12	8
New England	21	61	62
New York	2	45	37
Northern California	20	67	39
Northern Rocky Mountain	0	31	49
Ozark	26	19	92
Puget Sound	11	44	61
Southeastern	21	92	132
Southern California	0	2	3
Southwestern	0	2	7
Upper-Mississippi Valley	20	72	69
Washington	0	1	10
Wisconsin-Michigan	49	102	84
Totals	276	963	1,012

[1]Students, Junior, Affiliate, Associate (Initial) grades only.

SAFEST, SIMPLEST DRIP TORCH YOU CAN USE

FORESTER Seal-Tite Torch

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Welded tank with cushion base, double bottom, oil proof gaskets and tight valves SEALTITE against leakage.

No Pressure—No Preheating. Burns diesel oil, stove oil or mixed fuels with low flash-point.

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For treating all pruning wounds. Pure Egyptian black asphalt base protects against fungi. Will not crack, blister or freeze. In cans and drums, 1 pt. to 50 gal. 1 Gal., $5.50 delivered U.S.A. 6 Gal. (1 Case) $3.50 gal. delivered.

TP4 TREE PAINT CAN, one pint size, adjustable round brush enters can through brass tube. Screw top for filling. Encased in leather with belt loop. Complete, $5.50 delivered U.S.A.

Write for new catalog on tree tools and supplies

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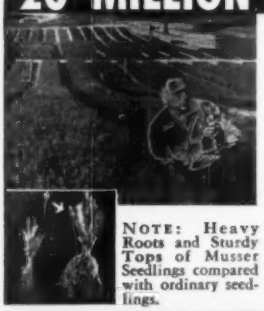
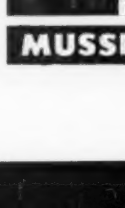
3015 E. Grand Blvd. Detroit 2, Mich.

20 MILLION TREES *a Year!*



Seedlings for Christmas Tree and Forest Tree plantings. Transplants for Conservationists, Timber Operators and Farmers. All from selected seed with good heredity characteristics. Our tremendous volume means wide selection at a *price saving* to you. For example:—

NORWAY SPRUCE—Fast growing 2-yr., S., 5-10", per 1000 ..... $35.00



NOTE: Heavy Roots and Sturdy Tops of Musser Seedlings compared with ordinary seedlings.

Write for Free Catalog with wholesale planting list. Ask for Free Christmas Tree Growers' Guide.

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Final Additions to AAAS Meeting Program

The final program of Section O (Agriculture) meeting of the American Association for the Advancement of Science, December 28-30 in Indianapolis, Ind., has been received, supplementing the program as published in the November issue of the JOURNAL. Of interest to foresters are these two additions to the final program under the December 28 afternoon program on "Recent Advances in Biological Control Measures":

Control of Forest Insects. J. A. Beal, entomologist, U. S. Department of Agriculture, Washington, D. C.

Control of Forest Diseases. J. R. Hansbrough, plant pathologist, U. S. Department of Agriculture, Washington, D. C.

Colleges and Universities in the United States Offering Instruction in Forestry (November 1, 1957)

Accredited

The following institutions are accredited for forestry instruction by the Council of the Society of American Foresters.

Alabama Polytechnic Institute, Department of Forestry, Auburn, Ala.

University of California, School of Forestry, Berkeley 4, Calif.

Colorado State University, College of Forestry and Range Management, Fort Collins, Colo.

Duke University, School of Forestry, Durham, N. C.

University of Florida, School of Forestry, Gainesville, Fla.

University of Georgia, School of Forestry, Athens, Ga.

University of Idaho, College of Forestry, Moscow, Idaho.

Iowa State College, Department of Forestry, Ames, Iowa.

Louisiana Polytechnic Institute, Department of Forestry, Ruston, La.

Louisiana State University, School of Forestry, Baton Rouge 3, La.

University of Maine, Department of Forestry, Orono, Maine.

University of Massachusetts, Department of Forestry and Wildlife Management, Amherst, Mass.

Michigan College of Mining and Technology, Department of Forestry, Houghton, Mich.

Michigan State University, Department of Forestry, East Lansing, Mich.

University of Michigan, School of Natural Resources, Ann Arbor, Mich.

University of Minnesota, School of Forestry, St. Paul 1, Minn.

University of Missouri, School of Forestry, Columbia, Mo.

Montana State University, School of Forestry, Missoula, Mont.

State University of New York, College of Forestry, Syracuse 10, N. Y.

(Continued on page 922)

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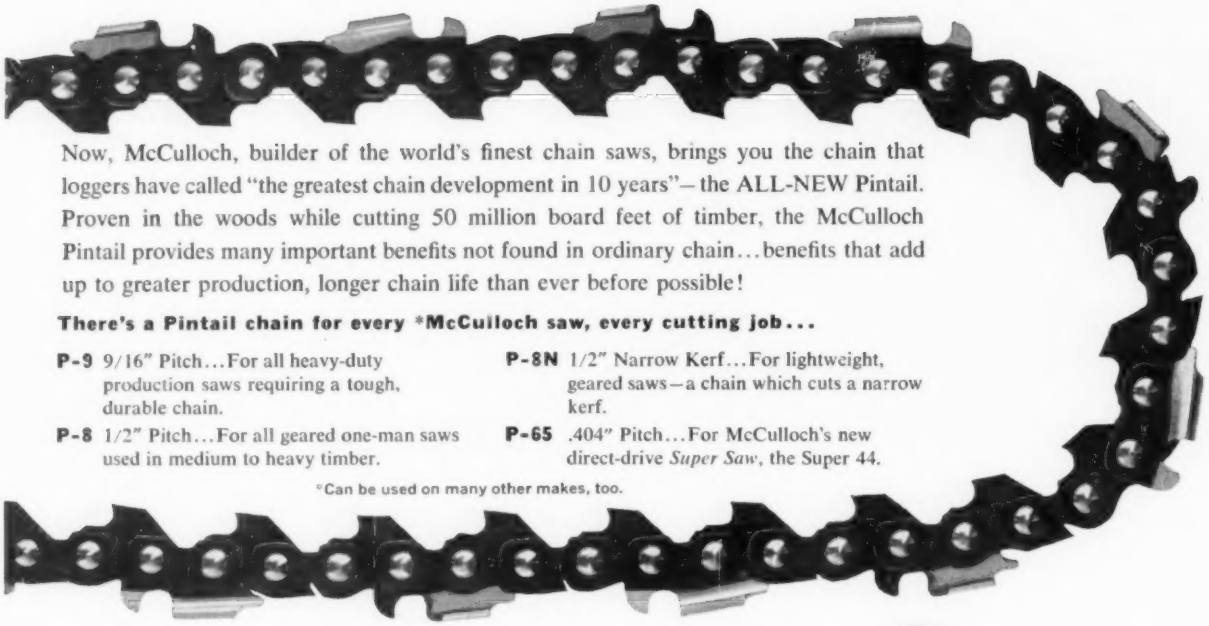
THE ALL-NEW McCULLOCH *pintail*



Now, McCulloch, builder of the world's finest chain saws, brings you the chain that loggers have called "the greatest chain development in 10 years"—the ALL-NEW Pintail. Proven in the woods while cutting 50 million board feet of timber, the McCulloch Pintail provides many important benefits not found in ordinary chain...benefits that add up to greater production, longer chain life than ever before possible!

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P-8N 1/2" Narrow Kerf...For lightweight, geared saws—a chain which cuts a narrow kerf.

P-65 .404" Pitch...For McCulloch's new direct-drive *Super Saw*, the Super 44.

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Try the saw that breaks the Power Barrier—

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Just 19 lb light, the 6.5 hp Super 44 is the fastest cutting of all direct-drive saws. Factory equipped with new Pintail chain at no additional cost. Try it.

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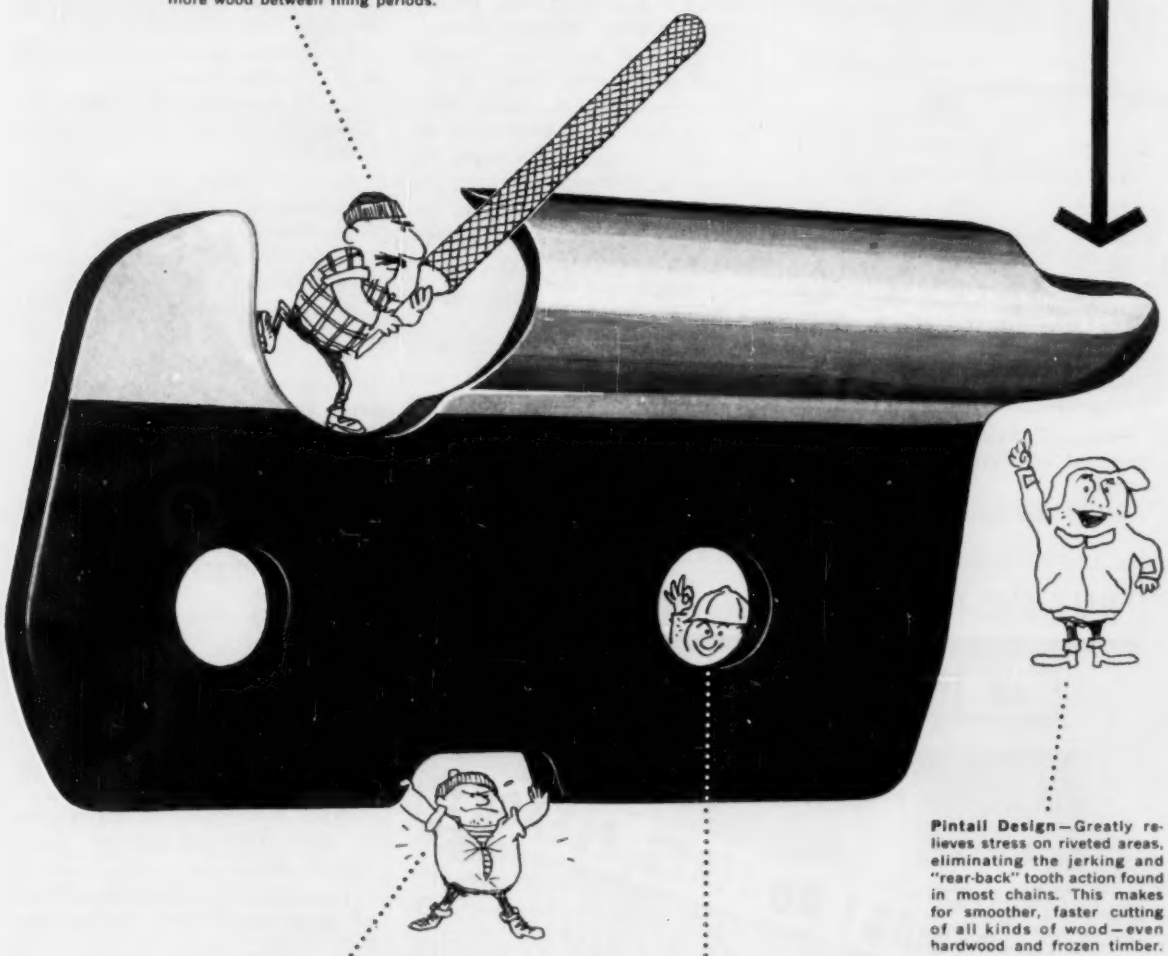
Highest Quality Steel—Higher carbon content steel plus a special heat-treating process—Aus-Tempering—give the chrome-plated cutter teeth a much harder cutting surface. Teeth hold their sharp edge longer, allowing you to cut more wood between filing periods.



Pintail Design—Greatly relieves stress on riveted areas, eliminating the jerking and "rear-back" tooth action found in most chains. This makes for smoother, faster cutting of all kinds of wood—even hardwood and frozen timber.

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North Carolina State College, School of Forestry, Raleigh, N. C.

Oregon State College, School of Forestry, Corvallis, Ore.

Pennsylvania State University, School of Forestry, University Park, Pa.

Purdue University, Department of Forestry, Lafayette, Ind.

Utah State University, College of Forestry, Range and Wildlife Management, Logan, Utah.

University of Washington, College of Forestry, Seattle 5, Wash.

West Virginia University, Division of Forestry, Morgantown, W. Va.

Yale University, School of Forestry, New Haven 11, Conn.

Not Accredited

The following institutions offer professional and/or technical curricula in forestry, but do not meet the requirements for accreditation.

Arkansas Agricultural and Mechanical College, Department of Forestry, College Heights, Ark.

Stephen F. Austin State College, Department of Forestry, Nacogdoches, Texas.

University of Connecticut, Department of Forestry and Wildlife Management, Storrs, Conn.

Harvard University, Harvard Forest, Petersham, Mass.

Mississippi State College, Department of Forestry, State College, Miss.

University of New Hampshire, Department of Forestry, Durham, N. H.

Oklahoma State University of Agriculture and Applied Science, Department of Forestry, Stillwater, Okla.

University of the South, Forestry Department, Sewanee, Tenn.

Southern Illinois University, Division of Rural Studies, Carbondale, Ill.

Virginia Polytechnic Institute, Department of Biology, Blacksburg, Va.

State College of Washington, Department of Forestry and Range Management, Pullman, Wash.

Introductory, Preforestry, and Specialized Courses

Abraham Baldwin Agricultural College, Tifton, Ga.

University of Arkansas, Department of Horticulture, Fayetteville, Ark.

Centenary College of Louisiana, Department of Biology, Shreveport, La.

Clemson Agricultural College, School of Agriculture, Clemson, S. C.

Cornell University, Department of Conservation, Ithaca, N. Y.

Grand Rapids Junior College, Grand Rapids, Mich.

Humboldt State College, Forestry Department, Arcata, Calif.

Idaho State College, Pocatello, Idaho.

University of Illinois, Department of Forestry, Urbana, Ill.

University of Kentucky, Department of Horticulture, Lexington, Ky.

Lassen Junior College, Division of Vocational Forestry and Lumbering, Susanville, Calif.

Marlboro College, Marlboro, Vt.

University of Maryland, Department of Horticulture, College Park, Md.

McNeese State College, Department of Agriculture, Lake Charles, La.

Nichols Junior College, Duddley, Mass.

North Dakota Agricultural College, Department of Horticulture and Forestry, Fargo, N. Dak.

North Dakota School of Forestry, Bottineau, N. Dak.

Northwestern State College, Agriculture Department, Natchitoches, La.

Ohio State University, Department of Horticulture and Forestry, Columbus 10, Ohio.

Paul Smith's College, Forestry Department, Paul Smiths, N. Y.

Pasadena City College, Pasadena 4, Calif.

University of Rhode Island, Forestry Department, Kingston, R. I.

Rutgers University, Department of Forestry, New Brunswick, N. J.

University of Tennessee, Department of Horticulture and Forestry, Knoxville 16, Tenn.

Texas A & M College, Department of Range and Forestry, College Station, Texas.

University of Vermont, College of Agriculture, Burlington, Vt.

University of Virginia, School of Forestry, Charlottesville, Va.

Wisconsin State College, Botany Department, Superior, Wis.

University of Wisconsin, College of Agriculture, Madison, Wis.

Ranger Schools

State Forest Ranger School of the University of Florida, Lake City, Fla.

State Ranger School of State University College of Forestry, Wanakena, N. Y.

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Without a single forest blaze!

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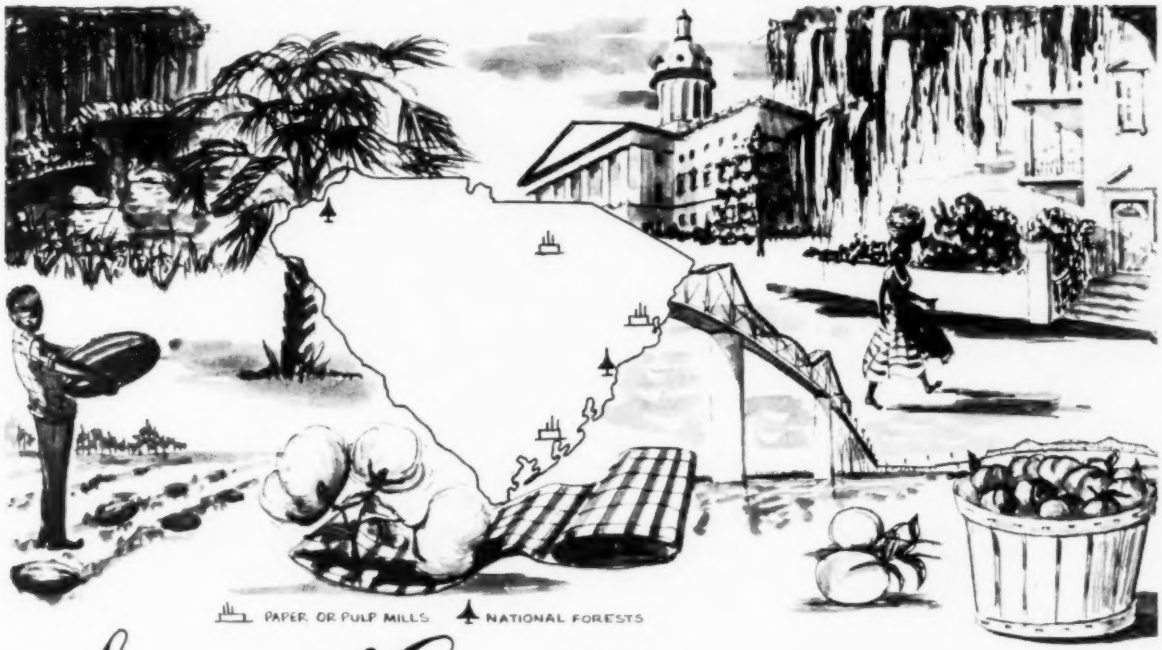

South Carolina

Transition—in a generation

In 1927, when Clemson, South Carolina's agricultural college, employed its first professional forester, early fall burning was the mark of a good farmer. In this almost totally agricultural economy, even the small farmer faithfully "swinged" his uncultivated acres annually.

Today, 30 years later, forests support South Carolina's second largest industry in value of manufactured goods. 61.6% of the state's 19,328,000 acres is in woodland. South Carolina was the first southern state to have a statewide forest fire control program. And, beginning with the current year, the Clemson College School of Forestry offers a full 4-year course.

Ninety-three percent of South Carolina woodlands is in private ownership, and of greater interest to the professional forester is the attitude of the landowners. South Carolina landowners not only accept the program; their demand for management services, as of most recent count, requires 28 consulting foresters in addition to services of the state agency and of conservation foresters employed by large tract owners.

The State Commission of Forestry was established by a 1927 Legislative Act effective in 1928. South Carolina is divided into 7 districts with District Foresters working directly with landowners. This Commission also cooperates with the Clemson College Extension Service which, through County Farm Agents, acquaints landowners with the value and availability of sound forestry practices. In recent years, pulp and other wood-working industries have added impetus through their conservation foresters and their wood procurement programs.

The Legislature's 1941 Marking Act, enabled the Commission to put marking and tally service on a fee basis. Commission rules limit work on a holding to one week of each year, automatically reserve state service to smaller farms, while consulting foresters manage larger tracts.

In addition to a "grass roots" education program that includes school agriculture-forestry projects, forestry demonstrations, highly publicized Conservation Week and Arbor Day, road side signs, motion pictures, consistent radio and TV programs, and informational service to school, clubs and civic groups, the state operates 3 seedling nurseries. The anticipated 1958-59 output of 100,000,000 seedlings, 40,000,000 more than the 1956-57 record, will not nearly satisfy demand.

Practically all of South Carolina's forest conservation problems can be solved only through the efforts of landowners and general public. The present receptive attitude has made possible great strides in a short period.

STATE COMMISSION OF FORESTRY—*Clemson College Extension Service—contribution to this series does not necessarily constitute endorsement of Southern Glo products.*

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Standard: Heavy duty planter for tractors with hydraulic lift. Usable on 20 h.p. and up wheel tractors — also on the smaller crawlers. Makes these sites plantable: heavy sod, stony soils, steep hillsides, brushy sites. Equipped with 20" coulter.

M-55: A low cost planter for the easier sites where no hillside adjustment is necessary. At $245 this is ideal for the small Christmas tree grower. Wearing parts same as the "Standard."

Literature sent on request. *Write* ROOTSPRED TREE PLANTER at ST. PETERSBURG, PENNSYLVANIA.

Membership Applications and Advancements

Proposals for admission, advancement, and reinstatements received in the Society office during the month of October are listed below.

Action on the eligibility of those proposed for membership as listed below will be taken by the Council as of January 1958. Communications from voting members regarding the membership eligibility of these persons should be received in the Society office prior to that date.

Allegheny Section

Student Grade

Biesterfeldt, R. C. Gregersen, H. M.

Junior Grade

Tekel, J. E., Forester, USFS, Bradford, Pa.; N.C. State, B.S.F., 1955.

Appalachian Section

Student Grade

DUKE UNIVERSITY

Buckner, R. G. Jennette, D. L.
Chapman, R. C. Krick, W. P.
Davis, J. R. Murawski, J. S.
Hanks, S. H. Perryman, J. H.
Wolfskill, S. H.

NORTH CAROLINA STATE COLLEGE

Allen, R. S. Jennings, J. S.
Bonner, L. D. Lennon, T. P.
Byerly, R. D. Lupold, H. M.
Capps, W. C. Owens, E. G.
Carr, D. G. Perryman, D. G.
Coker, W. J. Plowman, J. D.
Cooke, R. L. Rice, C. C.
Davis, T. P. Robbins, D. H.
Dodge, O. C. Roten, D.
Eggler, J. A. Scanlon, D. H.
Formy Duval, J. G. Smathers, S. T.
Freeman, W. E. Stoneypher, R. W.
Gibbon, E. L. Sturgill, J. C.
Gilbert, R. O. Sumner, L. B.
Glass, P. D. Tabor, C. A.
Gregg, S. W. Walker, T.
Hannah, H. D. Welch, R. V.
Winkler, D. G.

Junior Grade

Barnes, R. L., Research Associate, Dept. of Botany, Duke Univ., Durham, N. C. (Reinstatement).

Member Grade

Williams, J. F., Chief Consultant, J. F. Williams Co., Windsor, N. C.; N. C. State, B.S.F., 1943, Duke Univ., M.F., 1947. (Junior 1956).

Affiliate Grade

Bradley, H. V., Forest Tech., W. Va. Pulp & Paper Co., Summerville, S. C.

Central Rocky Mountain Section

Student Grade

COLORADO STATE UNIVERSITY

Barry, C. R. Day, E. D.
Springer, L. M.

Central States Section

Student Grade

PURDUE UNIVERSITY

Borem, D. G. Showalter, D. J.
Hoffman, R. D. Swain, D. H.
Leeds, E. E. Swartz, S. R.
Lentz, R. E. Terry, A. L.
McNabb, R. D. Tilson, W. C.
Naumann, J. R. Witters, R. L.
Patterson, L. W. Woodbury, G. S.
Schornick, L. L. Zernach, E. L.

Junior Grade

Schaller, D. W., Asst. Ranger, Ohio Div. of Forestry, Friendship, Ohio; Mich. State, B.S.F., 1951.

Wood, D. G., Logging Representative, Caterpillar Tractor Co., Peoria, Ill.; Univ. of Minn., B.S.F., 1954.

Columbia River Section

Junior Grade

Brown, B. E., Tbr. Appraiser, Crown Zellerbach Corp., Portland, Ore.; Wash. State, B.S.F., 1940. (Affiliate 1951).

Lysne, M. D., Forester, USFS, Carson, Wash.; Univ. of Minn., B.S.F., 1952.

Member Grade

Blinks, S. E., Forester, Weyerhaeuser Tbr. Co., Longview, Wash.; Univ. of Minn., B.S.F., 1951. (Junior 1951).

Dunlap, W. W., Prod. Trainee, Weyerhaeuser Tbr. Co., North Bend, Ore.; Univ. of Mich. B.S.F., 1953. (Junior 1953).

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Coming Events

Kentucky-Tennessee Section

The Kentucky-Tennessee Section has scheduled a meeting for December 6 and 7 in Nashville, Tenn.

Northern California Section

The annual winter meeting of the Northern California Section will be held in the Merchandise Mart, San Francisco, on December 7.

Western Forestry and Conservation Assn.

The Western Forestry and Conservation Association will hold its 48th annual conference December 11-13 in Seattle, Wash. Theme: "The business of tree farming."

Northeast Wildlife Conference

The Northeast Wildlife Conference will be held January 4-7, 1958, in Montreal, Canada. Information, reservations: Gustave Prevost, G 3, Universite de Montreal, Montreal 3, Que.

Southeastern Section Meeting

The annual meeting of the Southeastern Section will be held January 30-31, 1958 in Panama City, Fla. Theme: "Keeping abreast of present developments in the field of southern forestry."

Engstrom, W. H., Forest Mgmt. Asst., Ore. State Board of Forestry, Salem, Ore.; Iowa State, B.S.F., 1943. (Junior 1952).

George, G. W., Forester, USFS, Sisters, Ore.; Ore. State, B.S.F., 1951. (Junior 1951).

Lyne, F. J., Forester, USFS, Zigzag, Ore:; Ore. State, B.S.F., 1948, (Junior 1952).

Penny, W. F., Forester, Tbr. Service Co., Sweet Home, Ore.; Ore. State, B.S.F., 1953. (Junior 1953).

Quirin, A. F., General Sales Mgr., Willamette Valley Lbr. Co., Dallas, Ore.; Iowa State, B.S.F., 1942. (Junior 46R55).

Gulf States Section

Student Grade

LOUISIANA POLYTECHNIC INSTITUTE

Davis, W. H. — Kent, R.
Finton, J. P. — Parks, E. E.
Howe, J. E. — Tolar, E. E.
Weber, W. P.

LOUISIANA STATE UNIVERSITY

Alford, S. G. — Legg, J. E.
Ballard, J. C. — Linnartz, N. E.
Boone, R. S. — Lotan, J. E.
Burns, L. V. — Lowe, J. E.
Daigle, N. A. — Melancon, L. J.
Dalhoff, F. B. — Miles, B. R.
Evans, M. J. — Miranda, W. F.
Harper, P. J. — Schulte, J. L.
Kennedy, W. A. — Vales, E. R.
La Haye, H. — Whatley, L. W.
Lawton, J. M. — Williamson, D. L.

Affiliate Grade

Jorgensen, J. R., Forester, USFS, Alexandria, La.

Sheffield, W. J., Foresters Duties (Titleman), Humble Oil & Refining Co., Houston, Texas.

Inland Empire Section

Student Grade

UNIVERSITY OF IDAHO

Carpenter, S. B. — Pence, N. N.
Flanik, G. R. — Rogers, G. L.

Kentucky-Tennessee Section

Affiliate Grade

Prather, C. F., Service Forester, Ky. Div. of Forestry, Mayfield, Ky.

New England Section

Student Grade

UNIVERSITY OF MAINE

Borgeson, A. E. — Howard, J. K.
Brown, H. S. — Solari, R. L.

New Forestry Terminology

Forestry Terminology, the last edition of which was issued in 1950, has been revised and is now in press. It should be available early in 1958 from the Society of American Foresters, Mills Bldg., Washington 6, D. C.

Campeau, D. J. — Stansel, C. M.
Cloclough, D. M. — Thurston, A. S.
Finley, R. W. — Tiffany, C. P.
Higgins, J. F. — Walter, R. J.
Willcox, L. I.

UNIVERSITY OF MASSACHUSETTS

Federer, C. A. — Rich, J. P.
Hoyle, M. C. — Shaw, A. L.
Lampi, A. O. — Strathdee, D. B.

YALE UNIVERSITY

Makel, W. J. — Challinor, D.

Member Grade

Gray, A. R., Woodland Cons., Randolph, Vt. (Reinstatement).

New York Section

Student Grade

STATE UNIVERSITY OF NEW YORK

Dippold, R. M.

Junior Grade

Hampson, R. J., Forester, Natl. Lead Co., Tahawus, N. Y.; Univ. of Maine, B.S.F., 1953.

Northern California Section

Student Grade

UNIVERSITY OF CALIFORNIA

Alford, F. F. — Kaiser, W. J.
Cannon, W. M. — Lord, P. H.
Ceragioli, J. S. — McKinnon, R. L.
Clifford, J. J. — Morgan, G. D.
Connor, L. T. — Perkins, R. A.
Dennison, W. N. — Potter, D. A.
Drake, J. S. — Schaub, F. L.
Ervin, H. F. — Sharpe, F. W.
Goodacre, G. R. — Smith, J. C.
Hartzell, L. E. — Ziemer, R. R.

Member Grade

Cobb, D. I., Consulting Forester, Willows, Calif.; Univ. of Calif., B.S.F., 1951. (Junior 1951).

Everett, D. W., Eng. Aid, USFS, Klamath Natl. Forest, Yereka, Calif.; Univ. of Calif., B.S.F., 1953. (Junior 1953).

Martin, E. F., Forest Tech., Calif. Div. of Forestry, Fortuna, Calif.; Univ. of Calif., B.S.F., 1951. (Junior 1951).

Richey, L. E., Sr. Forest Tech., Calif. Div. of Forestry, Redding, Calif.; Univ. of Calif., B.S.F., 1949. (Junior 1953).

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Northern Rocky Mountain Section

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Blake, C. D., Forester, USFS, Missoula, Mont.; Mont. State, B.S. (Forest Mgmt.), 1953. (Junior 1953).

Marks, R. T., Extension Forester, Mont. State, Bozeman, Mont.; Mont. State, B.S.F., 1953. (Junior 1953).

Ozark Section

Student Grade

UNIVERSITY OF MISSOURI

Begeman, G. F.	Jacobs, B. J.
Benton, R. O.	Koelling, M. R.
Brunk, E. L.	Lackey, T. D.
Carter, W. B.	Larsen, R. S.
Colvin, P. F.	Lichterman, L. L.
De Voto, D. F.	Miller, H. N.
Dooling, O. J.	Niewals, A. E.
Gann, L. W.	Rollens, D. L.
Hall, R. R.	Runyon, N. E.
Harris, J. D.	Speight, H.
Heflin, E. L.	Thompson, J. M.
Huggans, J. L.	Vaughn, J. D.
Hulse, F. G.	Vinson, J. A.

Junior Grade

Wood, J. R., Instructor, Forestry Dept., Ark. A & M; Yale, M.F., 1957. (Affiliate 1953).

Puget Sound Section

Student Grade

UNIVERSITY OF WASHINGTON

Daniels, D. S.	Jones, A. B.
Davies, J. G.	Knutson, H. S.
Dobbs, R. C.	Majors, D. M.
Friis, R. E.	Miller, R. W.
Gregg, P.	Rodewald, L. W.

Schuh, J. D.

Southeastern Section

Student Grade

UNIVERSITY OF GEORGIA

Batchelor, W. R.	Hogan, M. J.
Beckham, W. C.	Kitchings, F. D.
Bryan, H. W.	Land, R. C.
Burns, J. R.	Murphy, R. N.
Curry, F. K.	Peeler, H. H.
Davis, H. T.	Reno, W. L.
Deaton, L. F.	Sandifer, T. A.
Edenfield, B. G.	Saville, A. K.
Gammon, G. L.	Tansil, R. F.
Hawley, L. L.	Williams, H. G.

Wyckoff, H. L.

Upper-Mississippi Valley Section

Student Grade

IOWA STATE COLLEGE

Arney, R. J.	Jensen, W. L.
Baker, D. P.	Meyer, G. C.
Barnes, G. D.	Orcutt, D. A.
Cukurs, P.	Polenz, A. R.
Eckart, T. O.	Rus, W. E.
Freel, R. D.	Sieverding, H. P.
Hardie, H. B.	Sloan, L. J.
Hetzer, R. E.	Teeters, J. L.

Vanek, D. V.

UNIVERSITY OF MINNESOTA

Luetgers, E. P.

Junior Grade

Gannaway, W. F., Forester, Minn. Forest Service, Blackduck, Minn.; Univ. of Minn., B.S.F., 1957.

Student Eligible for Automatic Advancement

IOWA STATE COLLEGE

Welch, G. A.

Member Grade

Smith, M. E., St. Paul, Minn. (Reinstatement).

Affiliate Grade

Carlson, C. H., Forester, Minn. Forest Service, Warroad, Minn.

Wisconsin-Michigan Section

Student Grade

MICHIGAN COLLEGE OF MINING & TECHNOLOGY

Aldrich, W. C.	Klammer, R. E.
Booker, R. G.	Korseberg, R. G.
Bunster, R. O.	Lewis, W. C.
Carlson, B. R.	Lundberg, J. F.
Cook, W. L.	Malkoff, E. P.
Daynard, R. O.	Mikich, A. R.
DesJardin, J. G.	Niver, C. R.
Dufour, F. X.	St. Avnold, U. S.
Gleason, G. C.	Stadelman, C.
Golin, L. D.	Spiroff, C. I.
Heikkinen, D. A.	Theisen, P. A.
Horak, J. E.	Tucker, G. F.
Kirschbaum, J. W.	Vande Hei, G. L.
Kisabeth, F. A.	Vanderlin, O. J.

Watson, D. B.

MICHIGAN STATE UNIVERSITY

Beauregard, M. J.	Plume, V.
Conkle, M. T.	Salo, K. W.
Erbe, L. E.	Schmidtman, D. M.
Grebasch, G. C.	Schreiber, R. W.
Grinstead, J. E.	Smith, D. J.
Hoffer, R. M.	Swartz, E. L.
Lacasse, L. R.	Ward, G. R.

Young, D. A.

UNIVERSITY OF MICHIGAN

Hill, L. W.	Norris, D. B.
Lupfer, W. B.	Schaefer, O. E.

Vance, J. A.

Member Grade

Bowman, R. P., Asst. Dist. Forester, Kimberly Clark of Mich., Inc., Champion, Mich.; Univ. of Mich., B.S.F., 1953. (Junior 1953).

No Section

Honorary Grade

Larsen, C. S., Head, Natl. Arboretum, Denmark.

Corresponding Grade

Landa, E. R., Universidad Nacional, Instituto Forestal, Medellin, Colombia.

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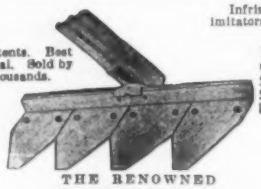

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Forestry News

University of Washington College of Forestry Celebrates 50th Anniversary

The University of Washington College of Forestry, which registered its first class in the autumn of 1907, celebrated its 50th Anniversary on Friday and Saturday, November 8th and 9th.

From an original staff of one full-time faculty member and two special lectures and a student body of eight freshmen and two graduate students, the College has grown to a faculty of 12 and a student body of 250 undergraduate students and 20 graduate students. In the intervening years over 1,500 foresters have graduated from the College and are practicing their profession throughout the world.

Also included as a part of the College are the Charles Lathrop Pack Demonstration Forest of 2,300 acres, the Lee Memorial Forest of 160 acres, and the University of Washington Arboretum of 267 acres.

The theme of the two-day Golden Anniversary celebration was "Once in a Lifetime." It began with an open house on the morning of November 8th. The alumni and guests were welcomed at a noon luncheon by Dr. Henry Schmitz, president of the University of Washington and a 1915 graduate of the College of Forestry.

A banquet was held Friday evening at which Mr. Frederick K. Weyerhaeuser, president of Weyerhaeuser Timber Company, spoke on "Forestry Fifty Years From Today." The toastmaster for the evening was Mr. W. B. Welsh, who has been intimately connected with forestry in the Northwest for many years.

The program on Saturday morning included talks by Don Colwell, president of the Washington Foresters' Alumni Association, and Mr. C. S. Cowan, who reminisced about "Amazing Episodes in the Forests—Old and New, False and True." The program ended with a salmon bake at the College Saturday noon.

Post Named to Chamber of Commerce Position

Appointment of Howard A. Post of International Falls, Minn., as forest resources assistant, Natural Resources Department, Chamber of Commerce of the United States, effective in October was announced by Chamber Executive Vice President, Arch N. Booth.

Mr. Post's assignment will include assisting state and local chambers,

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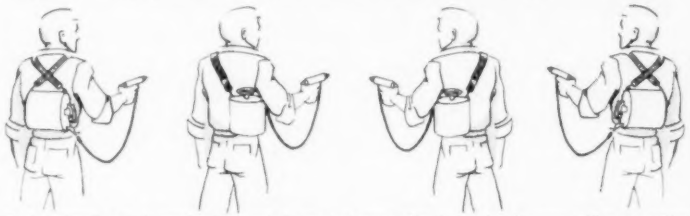

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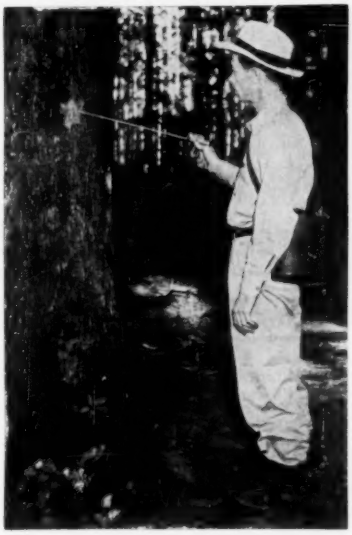

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trade associations, and business members of the Chamber in problems relating to the forest resource and its industries, federal land management, including grazing, and conservation of renewable resources.

A native of Minneapolis, Mr. Post holds a B.S. degree in Forestry from the University of Minnesota (1939) and a Master of Forestry degree in forest management and silviculture (1942) from Harvard University.

During World War II, he served as personnel officer with the Army Air Force. This was followed by service as a personnel officer with the United Nations' Relief and Rehabilitation Commission. He then became assistant executive secretary, Society of American Foresters.

Since 1948, Mr. Post has been forester with the Minnesota and Ontario Paper Company, International Falls, in charge of land acquisition, farm forest management plans, and cooperative programs.

He is a member of the Committee on Ethics of the SAF and the Minnesota Council of State Parks.

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Distinguished Forester Appointed Governor of Sweden's Norbotten Province

Prof. Manfred Näslund, director of Sweden's Forest Research Institute, was appointed Governor of Norbotten Province by the King, early in the summer.

This important appointment was a matter of much interest in the forestry circles of the Nordic countries and received much attention in the Swedish daily press and forestry magazines. Prof. Näslund is known by foresters in many countries. The position of provincial governor probably carries more prestige than any other political office in Sweden except cabinet positions. In practice the appointment is for life, up to retirement age.

Norbotten is the largest and northernmost of Sweden's 24 provinces. It lies farther north than Fairbanks, Alaska and includes part of Lapland. Though largely beyond the Arctic Circle it is a forest province in which fairly intensive forestry is practiced on the predominating national and forest-industry forests, and on the farm forests. The conversion of the once inaccessible virgin forests to managed forests is nearly complete.

Gov. Näslund graduated from Sweden's Royal College of Forestry in 1925. After a short period with the Swedish Forest Service he joined the Forest Research Institute in 1927 and became its director in 1944. He is succeeded by Prof. A. E. Hagberg, chief of Sweden's nation-wide Forest Survey which operates as a division of the Forest Institute.

FAO Reports Forest Products Output Increased in 1956

The steady rise in output of most forest products continued during 1956, and an even greater expansion is expected in 1957-58 in most parts of the world, the Food and Agriculture Organization of the UN has reported.

The FAO report on "The State of Food and Agriculture," recently published, says that world production of fuelwood changed very little; that of industrial wood rose by two percent, showing a five percent increase in world output of pulpwood, which reached a record level of 216 million cubic metres. International prices of pulpwood changed little during the past three years and the opening of the 1957 marketing season confirmed this stability.

Production of sawnwood, which had shown a steady increase in post-war years, was halted for the first time in

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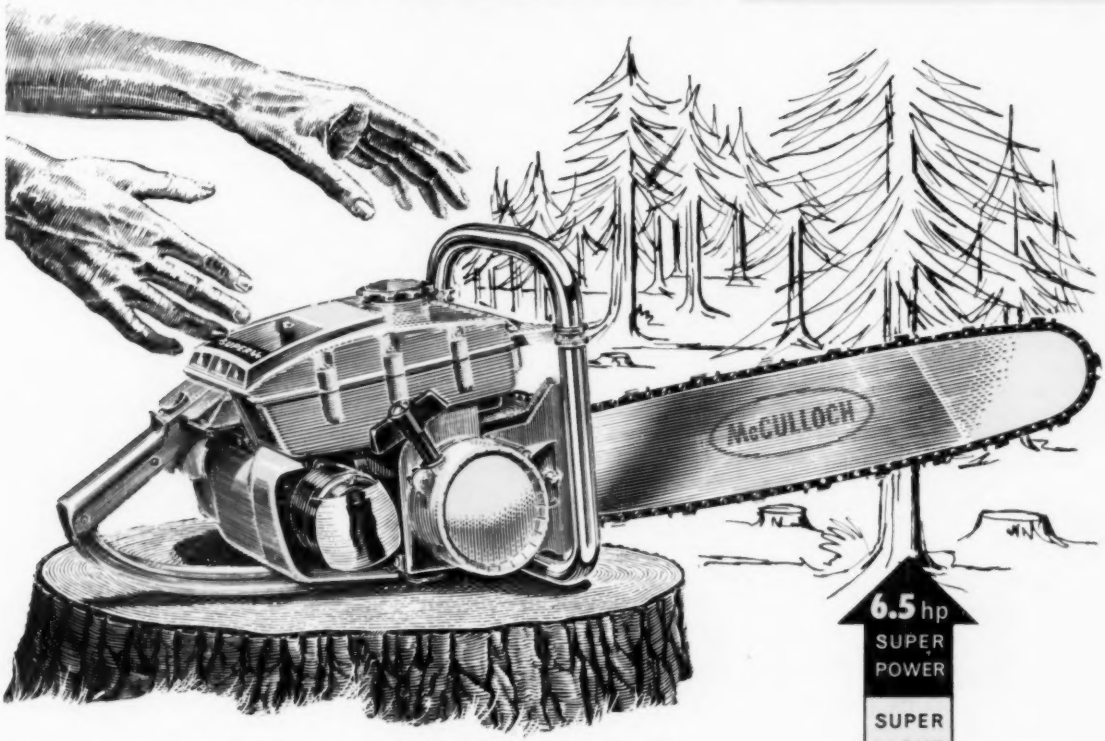

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1956, remaining slightly below 300 million cubic metres. Increases in the Soviet Union and Asia (particularly Japan) were offset by reductions in Europe and North America, due to a slackening in European industrial expansion and a decline in North American building activity. However, the report says that world consumption of sawnwood probably increased somewhat in 1956 in spite of the fact that, in both Europe and North America, it has reached a level where it will rise only slowly, if at all. New wood-based materials such as particle boards, with production expanding rapidly in the last two years, were already competing seriously in some of the traditional sawnwood markets.

Lake States Forest Tree Improvement Committee Meets

Eighty foresters and others interested in developing better forest trees attended the Third Lake States Forest Tree Improvement Conference at the University of Minnesota's North Central School of Agriculture, Grand Rapids, Minn., on September 17 and 18, reports Paul O. Rudolf, executive secretary of the Lake States Forest Tree Improvement Committee. The 2-day meeting included discussions, reports, and field trips.

Officers for the next 2-year period were elected as follows: chairman, W. H. Brener of the Wisconsin Conservation Department; vice-chairman, Stephen H. Spurr of the University of Michigan; and executive secretary, Paul O. Rudolf of the Lake States Forest Experiment Station.

A resolution was passed by the group recommending that the Society publish a special issue of the JOURNAL devoted to forest tree improvement, probably sometime during 1958.

ERNEST WRIGHT

"Smokey" Stamp Proposed

At its 43rd annual meeting in October the Texas Forestry Association by resolution formalized an earlier proposal that the Postmaster General be urged to issue a 3-cent postage stamp featuring Smokey Bear and commemorating the 350th anniversary of the American lumber industry. Various nation-wide conservation organizations, including the American Forestry Association, have indorsed the proposal.

Public

Forest Service Research Worker Retires

Retirement September 30 of Dr. Ernest Wright, U. S. Forest Service research pathologist, has been announced by Director R. W. Cowlin of the Pacific Northwest Forest and Range Experiment Station.

A specialist in control of forest nursery diseases, Dr. Wright has completed 32 years of federal service and is the author of many publications on forest tree diseases.

Dr. Wright accepted appointment in 1927 to the Department of Agriculture's Bureau of Plant Industry and was employed in the Division of Forest Pathology at San Francisco.

Since 1953, when forest disease functions of BPI were transferred to the Forest Service and the forest pathology division was assigned to the Pacific Northwest Forest and Range Experiment Station, Dr. Wright has served on the Portland staff.

A 1923 forestry graduate of Oregon State College, Dr. Wright earned an M.S. degree (forestry) from the University of California in 1928 and a Ph.D. degree (plant pathology) from the University of Nebraska in 1941.

Association of State Foresters Announces Officers

At the annual meeting of the Association of State Foresters, held in Longview, Wash., in September, the following officers were elected:

President—J. Whitney Floyd, chief forester, Logan, Utah.

Vice President—F. H. Claridge, state forester, Raleigh, N. C.

Secretary-treasurer — Ralph C. Wible, deputy secretary, Department of Forests & Waters, Harrisburg, Pa.

Member of Executive Committee—Roger L. Guernsey, state forester, Boise, Idaho.

The 1958 annual meeting of the Association will be held in Ohio.

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Advisory Group Stresses Multiple-Use Management

Meeting in Ogden, Utah, in September, the U. S. Department of Agriculture's Forest Research Advisory Committee recommended to the Department that research activities be directed toward study of maximum multiple-use benefits from timber, game, livestock use, recreation, and improved water supplies. It also stressed the need for research into use of hardwoods for pulp, for expanded studies of costs and profits of various timber crops under different systems of management and utilization, and for more research into fire prevention and control.

In forest management top priority was given to studies of forest regeneration techniques and of site productivity. In range and watershed management, strenghtened work on hydrologic functions of forests and ranges was stressed. In forest protection, first priority was given to the whole area of fire studies, second to the control of insect pests by biological and silvicultural methods. Top need in forest economics, according to the committee, is study of timber costs and profits and strengthening of the Forest Survey. More research in forest products utilization, timber harvesting, and in marketing were also recommended.

A. D. Craft Promoted to Alaskan Position

Archie D. Craft, staff forester, Idaho State Office of the Bureau of Land Management, has been recently promoted to the position of fire control officer for the Bureau of Land Management Operational Office in Anchorage, Alaska.

This office handles the fire control for all of Alaska south of the Continental Divide with the exception of the panhandle area and the national forest withdrawals. The area north of the Alaskan Range is administered from the Operational Office at Fairbanks. The Bureau of Land Management is the land managing agency for almost all of interior Alaska. There are some national forest lands along the southern coastline and on the Kenel Peninsula and some private land in the more productive valleys.

Since ground transportation facilities are very limited the use of aircraft is employed to a great extent in fire control work. The area is fortunate in having many lakes suitable for landing aircraft and the Bureau possesses several airplanes used for trans-

porting equipment and fire fighting personnel to remote areas.

Mr. Craft has been active in Society affairs and most recently was credited by his co-workers as doing an outstanding job as secretary-treasurer of the Intermountain Section of the SAF.

Clarence C. Strong Retires

Clarence C. Strong, formerly assistant regional forester in charge of state and private forestry, and more recently serving on a special assignment in the Division of Fire Control with the Regional Office of the Forest Service in Missoula, Mont., retired following 33 years of federal service, according to an announcement by Regional Forester Charles L. Tebbe.

Mr. Strong is a native of Oregon. He received his degree in forestry from Oregon State College School of Forestry in 1924.

His government service began in 1924 with the Office of Blister Rust Control, Bureau of Entomology and Plant Quarantine. He transferred to the Forest Service at Missoula in 1934 and remained there until transfer as supervisor of the Coeur d'Alene National Forest, Coeur d'Alene, Idaho, following which he returned to Missoula in 1946.

P. N. Wick to Education Assignment

Transfer of Pat N. Wick from district ranger of the Monte Cristo District, Mt. Baker National Forest, to a staff position in the regional office of the Pacific Northwest Region of the U. S. Forest Service at Portland, Ore., has just been announced by Regional Forester J. Herbert Stone.

Wick will be assigned to the Division of Information and Education where one of his major duties will be to assist educators, public school and college officials in planning and conducting conservation education workshops. He will also help teachers and others with their programs of instruction in natural resource conservation practices.

San Juan Forest Supervisor Change Announced

Gordon J. Gray, supervisor of the San Juan National Forest at Durango, Colo. since 1953, has accepted a position in administration management in the U. S. Forest Service Denver Regional office. He began duties about October 1.

Virgil R. Carrell, assistant to the head of the Division of Timber Management in the regional office at Denver, will succeed Gray as San Juan Forest supervisor.

A graduate of Michigan State University, Gray has served with the Forest Service since 1933. Prior to his assignment as supervisor of the San Juan Forest, he spent four years in the Operations Division of the chief forester's office in Washington, D. C.

Carrell is a graduate of the University of Washington School of Forestry. Also a career employee of the Forest Service, his assignments date back to 1931.

Bruce Transfers to Alaska, Johnson to Washington

Transfer of Mason B. Bruce, for the past four years supervisor of Olympic National Forest, Olympia, Wash., to the Alaska Region has been jointly announced by Regional Foresters J. Herbert Stone and P. D. Hanson of the Pacific Northwest and Alaska Regions of the U. S. Forest Service. Bruce replaced Howard Johnson, head of the resource division, who is being transferred from Alaska to Washington, D. C. to the office of the chief of the Forest Service.

Education

Mason to Deliver Winton Lecture

David T. Mason of Portland, Ore., has been chosen as 1957 Winton Lecturer in Industrial Forestry at the University of California. He will deliver a public lecture there on December 11.

Mason is the founder and senior partner of Mason, Bruce and Girard, an eminent professional forestry consultant firm.

Mason received his professional forestry training at Yale University, worked with the U. S. Forest Service for eight years, and for five years was professor of forestry at the University of California at Berkeley.

The Winton Lectures were established last year by the Winton Lumber Company, Minneapolis, Minn. and

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Martell, Calif. to furnish an opportunity for interchange of ideas and technical information between staff and students of the School of Forestry of the University of California and foresters from private forest industries.

J. G. Yoho Named to Duke University Faculty

Dr. James G. Yoho, at the time a faculty member at Iowa State College, was recently named associate professor of forest economics in the School of Forestry of Duke University.

Yoho received his B. S. degree from the University of Georgia in 1947, his M.F. from the State University of New York College of Forestry in 1948, and his Ph.D. from Michigan State in 1957. He has previously taught at Stephen F. Austin State College in Texas, worked as a consultant in East Texas, and served three years with the (then) Army Air Force.

Dr. Yoho has written numerous articles and has published a number of bulletins on forest management and marketing.

Four-Year Forestry Program at Southern Illinois University

Southern Illinois University, Carbondale, which has been offering a two-year preforestry curriculum, has announced that it has started a Department of Forestry in the School of Agriculture, setting up a four-year program leading to the degree bachelor of science in forestry.

A. B. Castner, chairman of the Plant Industries Department in the School of Agriculture, has been named acting chairman of the Department of Forestry. Dr. Castner is not a professional forester.

The Sahara Coal Company has established a number of scholarships for forestry students at the University.

Maine Announces School Status

Maine University President Dr. Arthur A. Hauck has announced various changes in school and departmental status at the University to take effect in the spring semester of 1958. Included was advancement of the Department of Forestry, in the College of Agriculture, which will be known as the School of Forestry. The department has been a unit of the college for 52 years.

Harold Scholten Joins Minnesota Staff

Harold Scholten has been appointed an instructor in the University of Minnesota School of Forestry, it was announced by Frank H. Kaufert, director of the School.

Scholten received his Bachelor of Science degree from Purdue University in 1949 and the Master of Forestry degree from Purdue University in 1950. He was employed by Purdue University as district extension forester for west central Indiana for four and a half years and was assistant extension forester in Illinois for two and a half years.

Scholten will teach courses in farm forestry and carry on various research projects.

Private & Industrial

Kimberly-Clark Official Honored for Forestry Leadership

Robert W. Lyons, Kimberly-Clark Corporation vice president and director, received an honorary Doctor of Laws degree from the University of Toronto October 25 "in recognition of outstanding leadership in forestry."

The Kimberly-Clark official was acknowledged as one of North America's outstanding authorities on industrial forestry and a pioneer in establishing the place of technical foresters in industry. He received the honor during a special convocation, part of the university's observance of the 50th anniversary of the founding of the Faculty of Forestry.

Mr. Lyons, the first Canadian forester to enter private industry, joined the Laurentide Paper and Power Company of Canada after receiving his forestry degree in 1916 from the same university which honored him October 25.

After a year of study abroad in 1927, Mr. Lyons became associated with Kimberly-Clark through its affiliated company, the Spruce Falls Power and Paper company of Kapuskasing, On-

tario.

Kimberly-Clark's activity encompasses five forest nurseries with an annual capacity in excess of 16 million trees and management of extensive forest properties. There are 125 graduate foresters staffing the operations, including a forest pathologist and an entomologist. In relation to production and sales, the number of graduate foresters employed is said to be higher than for any other company in North America.

Mr. Lyons was honored not only for contributing largely to the advancement of science in forestry in Kimberly-Clark and its subsidiary and associated companies, but in the pulp and paper industry generally.

W. Va. Pulp and Paper Official Retires; Lenhart to Head Timberlands

William J. Bailey, vice-president in charge of woodlands and traffic and a member of the board of directors, retired October 1 as an active employee of West Virginia Pulp and Paper Company. He will continue to serve as a director.

Mr. Bailey's timberland duties have been assumed by D. Y. Lenhart, who has been named general manager of the Timberlands and Real Estate Division. Responsibility for the Company's traffic operations has been assigned to Joan C. Albert, general traffic manager.

Mr. Bailey had served as an executive with West Virginia Pulp and Paper Company for 23 years.

He assumed responsibility for the Company's timberland operations in 1942, and was elected a vice-president and director in 1944. In 1955 and 1956 he served as president of American Forest Products Industries, Inc., and has been a director and member of the executive committee of the American Pulpwood Association and chairman of the Traffic Committee of the American Paper and Pulp Association.

Mr. Lenhart, the new general manager of the Company's timber operations, started with the Company as a district forester in South Carolina in 1937. He became assistant manager of its Southern Woodlands in Summerville, S. C., in 1946 and was promoted to woodlands manager in New York in 1952. He holds forestry degrees from Pennsylvania State University and North Carolina State College.

TECO Celebrates Silver Anniversary

Twenty-five years of continuous service to the lumber and wood products industries in research and engineering were celebrated by Timber Engineering Company at its silver anniversary directors' meetings in November, according to Harry G. Uhl, president. The company was organized in January 1933, as an independent, incorporated affiliate of the National Lumber Manufacturers Association for the purpose of promoting the use of wood through modern engineering practice and research studies.

In 1943, the Timber Engineering Company wood products laboratory was opened, expanding the scope of its services, to provide research and testing facilities. Its latest expansion program, completed last year, included a fully equipped wood particle board pilot plant and companion facilities. One well known achievement of the wood industry-owned service organization is the *Timber Design and Construction Handbook*, a compilation of the essential basic information needed to design and build in timber.

C. W. Richen Succeeds E. P. Stamm

Clarence W. Richen has been named manager of the Crown Zellerbach Corporation's northwest timber department. He succeeds E. P. Stamm who has retired after 31 years with the corporation.

Richen will administer the company's 12 tree farms, totaling some 700,000 acres, as well as the work of 900 woods and forestry employees. He had been Stamm's assistant since June 1956, was previously company chief forester for 10 years, and before that worked in forest management for the company. He is a graduate of Oregon State College and is currently an associate editor of the JOURNAL OF FORESTRY.

Mr. Stamm, who is continuing with the firm as a forestry consultant, was honored upon his retirement. Crown Zellerbach renamed its Columbia County Tree Farm in Oregon the Edward P. Stamm Tree Farm.

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Northeastern Logging Congress

The 4th annual Northeastern Logging Congress expected to be attended by nearly 500 persons from forest industries and related fields from 15 northern states, will be held April 21-23, 1958, at the Mark Twain Hotel in Elmira, N. Y. The congress is sponsored by the Northeastern Loggers' Association.

The program will include a banquet and a series of panel discussions. Preliminary topics include: problems of small sawmill operators, greater safety in woods operations, practical forest management, and new methods and machinery.

William L. Faull, Jr., of Bradford, Pa., is association president. Fred Simmons of the Northeastern Forest Experiment Station, Upper Darby, Pa., is general program chairman for the congress.

D. E. Wade New Editor of Conservation Journal

Douglas E. Wade of Columbia, S. C., has been appointed editor of the *Journal of Soil and Water Conservation*, according to a recent announcement by J. S. Russell, president of the Soil Conservation Society of America.

Since 1953 Mr. Wade has been associate editor of *South Carolina Wildlife*, a publication of the South Carolina Wildlife Resources Commission.

He has an M. S. degree from the University of Wisconsin where he was a student of Aldo Leopold.

Fair Elected President of Mississippi Association

Davis L. Fair, Jr., lumberman of Louisville, Miss., was elected president of the Mississippi Forestry Association at the 19th annual meeting held in October at Jackson.

During the past year Fair served as vice president and previously was on the board of directors. He is president of D. L. Fair Lumber Company.

Elected vice president was Ben M. Stevens, Jr., Richton. Secretary-treasurer is Ralph Taggart, Crosby.

Members of the executive committee are: John Squires and A. Ray Tillman, Jackson; S. E. Moreton, Jr., Brookhaven; Jack Stuart, Morton; T. H. Harris and J. S. Olden, Laurel; Dick Allen, Philadelphia; John Thompson and John Tyler, Natchez; and Marion Stephens, Columbia.

Industrial Forestry Association Adds Forester to Staff

Calvin L. Smith has been appointed district forester for the Industrial Forestry Association at Medford, Ore., to handle the association's Tree Farm Program in that area, according to W. D. Hagenstein, executive vice president of the Association, with headquarters in Portland.

Smith, a graduate of the School of Forestry, University of Minnesota, has worked for five years in industrial forestry in the Douglas-fir region. He will work directly under H. R. Glascock, Jr., the Association's district forester at Eugene, Ore.

Smith's appointment increases the staff of the Association to eight foresters.

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GREETINGS
and in the delight and thankfulness of those who receive.
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Forestry Employment

S.A.F. members are privileged to insert one 60-word advertisement in this column without charge. Forest industries desiring to employ foresters may insert advertisements at the rate of $4 per column inch. Copy must be received by the end of this month for an advertisement to appear in the issue after next.

Obviously, the Society cannot assume responsibility beyond making it possible for prospective employee and employer to enter into negotiations.

Positions Wanted

Forester, B.S., New Hampshire, 1953. Age 26, married, one child. Employed by state forestry department. Desire employment in Northeast or Middle Atlantic States, but will consider other locations.
Box Q, Journal of Forestry, Mills Building, Washington 6, D. C.

Forester, B.S., University of Maine, 1950, age 32, married, 1 child, veteran. Experience: some cruising, three years in statistics and quality control, 18 credits towards advanced degree in Industrial Mgt. Desire management position in New England, preferable in Maine.
Box R, Journal of Forestry, Mills Building, Washington 6, D. C.

SOCIETY OF AMERICAN FORESTERS

Constitution and Bylaws

Mills Building
17th Street and Pennsylvania Avenue, N.W.
Washington 6, D. C.

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Articles of Incorporation

THIS is to certify that we, whose names are hereunto subscribed, citizens of the United States, a majority of whom are citizens of the District of Columbia, have associated ourselves together, pursuant to provisions of Chapter XVIII, sub-Chapter III, of the Code of Law for the District of Columbia, approved March 3, 1901, and Acts of Congress amendatory, thereto, under the corporate name of SOCIETY OF AMERICAN FORESTERS.

The term for which the Society is organized is perpetual.

The particular business and objects of the Society are to encourage a broad and constructive practice of forestry; to stimulate research and achievement in the science of forestry; and to advance the profession of forestry through cooperative thought and a spirit of solidarity among foresters.

The number of managers of the Society shall for the first year of its existence be eleven.

Witness our hands this 3d day of October, A. D. 1928.

R. Y. STUART,
R. V. REYNOLDS,
OVID M. BUTLER,
JOHN H. FAHRENBACH,
BERNARD A. CHANDLER.

District of Columbia, *ss:*

I, Margaret S. Sears, a Notary Public in and for the District of Columbia, do hereby certify that R. Y. Stuart, R. V. Reynolds, Ovid M. Butler, John H. Fahrenbach, and Bernard A. Chandler, parties to the foregoing and annexed Certificate of Incorporation of Society of American Foresters, bearing date on the 3d day of October, A. D. 1928, personally appeared before me in the District aforesaid the said R. Y. Stuart, R. V. Reynolds, Ovid M. Butler, John H. Fahrenbach, and Bernard A. Chandler, being personally known to me to be the persons who made and signed the said certificate, and severally acknowledged the same to be their act and deed for the purposes therein set forth.

Witness my hand and official seal this 3d day of October, A. D. 1928.

MARGARET S. SEARS,
Notary Public, D. C.

Constitution

Article I
Name

The name of this Society shall be SOCIETY OF AMERICAN FORESTERS.

Article II
Objects

The objects of this Society shall be to represent, advance, and protect the interests and standards of the profession of forestry, to provide a medium for exchange of professional thought, and to promote the science, practice, and standards of forestry in America.

Article III
Membership Defined

Sec. 1. The membership of the Society shall consist of Junior Members, Members,[1] Fellows, Affiliate Members, Associate Members, Student Members, Corresponding Members, and Honorary Members.

Sec. 2. Members and Fellows shall be at the time of their election citizens of the United States, its possessions, or Canada. Student Members, Affiliate Members, Junior Members, and Associate Members shall be, at the time of their nomination for membership, citizens of the above-mentioned countries or shall have declared, in a legally accepted manner, their intention of becoming citizens.

Sec. 3. Student Members shall be junior or senior students, or graduate students not eligible for the Junior Member grade, regularly enrolled in approved curricula at accredited schools of forestry.

[1]Formerly Senior Members.

Sec. 4. Affiliate Members shall be persons (1) who have had education in forestry but who do not qualify for Junior Membership; or (2) who have had six years or more of practical experience in the production of timber crops or management or protection of the forest resources of forest land, and who have demonstrated their ability in practical forest administration as evidenced by employment in positions of responsibility.

Affiliate Members may be elected to Junior Membership on showing proof of eligibility.

Sec. 5. Junior Members shall be graduates of curricula approved by the Council in institutions accredited by the Council; or in lieu of such training they shall show proof that they have acquired a combination of technical experience and education sufficient for a professional career in forestry and equivalent to the training given in an approved curriculum in an institution accredited by the Council.

Sec. 6. Members[1] shall be elected from the Junior Members and shall have had at least three years' experience in forestry subsequent to the date they met the requirements for Junior Membership. Advancement to Member shall indicate that in the opinion of the Council the candidate is possessed of both the requisite theoretical and practical experience and has demonstrated his acceptance of such standards of professional conduct and character as to justify the Society in accepting him as competent to represent the profession honorably and capably in the performance of his duties. Members shall be engaged in forestry work at the time of election.

Sec. 7. Fellows shall be foresters recognized generally throughout the profession as persons who have rendered outstanding service to forestry and to the Society. They shall be elected from the Members.

Sec. 8. Associate Members shall be persons not foresters who are scientists or technicians in fields closely allied to forestry and who are rendering substantial service to forestry, or other persons whose work and interests have furthered forestry in a substantial manner, who have shown a comprehensive understanding of the objectives of forestry, and whose association with forestry is such as to be recognized by the profession generally.

Sec. 9. Corresponding Members shall be foresters who are not citizens or residents of the United States, its possessions, or Canada, but who have shown substantial interest in American forestry.

Sec. 10. Honorary Members shall be (1) persons not foresters who have rendered distinguished service to forestry either in America or abroad, or (2) professional foresters of outstanding achievement whose field of work lies outside of, and who are not citizens of, the United States, its possessions, or Canada.

Sec. 11. Junior Members, Members, and Fellows, if in good standing, shall be entitled to vote on any question before the Society as a whole. Other classes of members may attend any meeting of the Society and take part in the discussions, but shall have no vote.

Article IV
Admission to Membership

Sec. 1. All admissions to membership,

reinstatements, and advancement from the grades of Student Member, Affiliate Member, or Junior Member to a higher grade shall be by vote of the Council.

The Council may delegate this authority to the Executive Secretary in the case of applicants for reinstatement, for Student Membership, for Junior Membership who are graduates of approved curricula in accredited schools, for Affiliate Membership who qualify wholly on the basis of education, and for automatic advancement from Junior Membership to the Member grade.

For all other applicants, the Council may delegate this authority to a Council Committee of three appointed by the President. The unanimous vote of this Council committee shall be required to elect an applicant; a split vote by the committee shall require consideration by the whole Council. When the whole Council acts on a doubtful case or one rejected by the Council committee, eight affirmative votes shall be necessary to elect.

At least one month prior to action by the Council, the names of all applicants with a statement of their qualifications, shall be referred to the entire voting membership for comment or protest.

Sec. 2. Applications for the following two grades of membership may be endorsed by one voting member: Student Membership and Junior Membership when applicants are graduates of approved curricula in accredited schools. Applications for Affiliate Membership who qualify on the basis of education may be endorsed by three voting members.

Applications for all other grades of membership shall be endorsed by the Sections except for applicants residing outside the territory of a Section in which case they may be endorsed by three Members or Fellows.

Immediately upon a Junior Member's fulfillment of the requirements for Member, he may make application or the Section in which he is domiciled may nominate him for the Member grade. A Junior Member who, at the expiration of six years, has not applied or who has not been nominated by a Section for the Member grade, and who is actively engaged in forestry work, shall automatically become a Member unless his advancement is protested on the basis of lack of competence or for other reasons, and the protest is sustained by the Council.

Annually, the Executive Secretary shall notify each Section of every Junior Member in its territory who is completing his sixth year of membership, and shall request a report on him and an endorsement if he is eligible for Member. Instances of questionable eligibility shall be referred to the Council, which body shall interpret the "actively engaged in forestry work" in doubtful cases. Thus those who have been Junior Members for six years, who are actively engaged in forestry work, who have had three years' experience in forestry, and whose advancement is not protested on grounds of competence or for other reasons, shall be certified as full Members by the Council.

Sec. 3. Nominations to the grade of Fellow shall be made by the written endorsement of twenty-five Members and/or Fellows.

Sec. 4. Election to the grade of Fellow shall be concurrent with the regular biennial Council election, and shall be by letter ballot of the Fellows, the members of the Council, the chairmen of the Sections, and the chairmen of the subject Divisions. The total number of votes necessary to elect shall be determined by the Council as provided by the Bylaws.

Sec. 5. Charges of unprofessional conduct against a member must be submitted to the Council in writing by five or more voting members. The Council shall consider proceedings looking toward the expulsion of any member for unprofessional conduct. It may delegate this function or any part thereof to a committee or committees on disciplinary action. The accused shall be informed of the charges against him, and be afforded an opportunity to be heard.

The affirmative vote of eight members of the Council shall be necessary to expel, reprimand, censure, or otherwise discipline a member.

Sec. 6. Conditions under which membership may be terminated or former members reinstated shall be defined in the bylaws.

Article V
Dues

Sec. 1. An admission fee of $5 shall be assessed upon original election to membership, but shall not be assessed for advancement to higher grades or for election to the grades of Student Member, Corresponding Member, and Honorary Member.

Sec. 2. Effective January 1, 1958 annual membership dues shall be as follows:

For Fellows, $15.

For Members, $12 for their first six years in this grade; $15 thereafter.

For Junior Members and Affiliate Members, $6 for their first three years in this grade; $9 for their second three years in this grade; $12 thereafter.

Dues of Junior Members advanced from the Affiliate grade shall be based on the date of their election to Affiliate Membership.

For Associate Members, $9.

For Student Members, $3.

Honorary and Corresponding Members shall not be charged dues.

Sec. 3. Annual dues shall be payable from the first day of January. Members in arrears on July 1 shall be declared in bad standing and shall forfeit from that date, until their dues are paid, the right to vote, to be elected to office, or to receive the official publications of the Society.

Entrance fees and dues of newly elected members shall be payable upon their acceptance of election to membership. Members elected after April 1, July 1, and October 1, respectively, shall be charged three-fourths, one-half, or one-fourth of the annual dues for the year as indicated by the date of election except that members admitted to the Society after December 1 shall not be charged dues for the remainder of the calendar year.

Members promoted to a higher grade shall be charged with the dues for said grade, beginning with the quarter-year in which they were elected.

The Council may remit the dues of any member for any special reason as provided in the bylaws.

No member of any grade shall be entitled to any return of fees or dues upon severance of his connection with the Society.

Sec. 4. Members and Fellows who retire from active forestry practice, after having been members of the Society for 20 years or more, may upon application to the Council continue as voting members but have their dues remitted except for an annual charge of $5 should they desire to receive the JOURNAL OF FORESTRY and other Society publications.[1]

Article VI
Officers

Sec. 1. The officers of the Society shall be a President, a Vice President, and an Executive Secretary.

Sec. 2. The President and Vice President shall be elected from the Members and Fellows as provided in Article VIII, and shall serve for two years from January 1, or until their successors are elected. The Executive Secretary shall be appointed by the Council which is empowered to enter into contractural relations with him during the period not exceeding two years for which he is appointed.

Sec. 3. The President shall preside at meetings of the Society, shall be chairman of the Council, shall appoint such committees as may be approved by the Council, and shall perform all other duties incident to his office.

Sec. 4. In the absence of the President, or in his inability to act, his duties shall be performed by the Vice President. In the event neither can serve, the Council shall appoint a president pro tempore.

Sec. 5. The Executive Secretary shall be the executive officer of the Society under the general direction of the Council. He shall perform the duties of treasurer, be custodian of the funds and securities of the Society, and shall furnish bond in suitable amount as determined by the Council.

[1]At its meeting of June 13-15, 1954 the Council adopted the policy that "retirement from active forestry practice, as provided in Article V, Section 4, shall be interpreted as applying to members retired from fulltime employment, either in forestry or other fields, with consequent substantial reduction in the income of the members concerned."

Article VII

Council

Sec. 1. The Society shall be governed by a Council comprised of the President, Vice President, and nine elected members.

Sec. 2. The members of the Council shall be elected from the Members and Fellows as provided in Article VIII. Members elected to the Council shall serve two years. The President, Vice President, and members of the Council may be nominated and elected for additional terms of two years.

Sec. 3. The Council shall control the funds of the Society; shall have the power to fill any vacancies occurring in its number; and shall perform such other duties as prescribed in the several articles and sections of the Constitution.

The Council shall receive and act upon charges of unprofessional conduct preferred against any member of the Society, as provided in Article IV, Section 5.

The Council shall have power, by vote of at least eight of its members, to draft and establish bylaws but no such bylaws shall abrogate or be inconsistent with any part of this Constitution.

Any action of the Council may be brought before the Society at large on written petition of not less than 250 voting members representing at least three different Sections with at least 25 members from each. This provision shall not apply to jurisdiction over cases of disciplinary action nor to administrative matters, including the appointment or dismissal of the Executive Secretary and Editor, in which cases the decision of the Council shall be final.

Six members of the Council shall constitute a quorum.

Article VIII

Election of Council

Sec. 1. A nominating committee shall be appointed by the President, with the approval of the Council, not later than April 1 of the year in which an election is to be held. It shall be the duty of this committee (1) to provide that there shall be at least two candidates presented for the office of President and at least nine candidates presented for members of the Council; (2) to receive separate nominating petitions from the membership at large for the office of President and for each member of the Council, and to supplement such petitions with other nominations when necessary to comply with provision (1) above. All candidates for President shall be considered as nominated also for Vice President; (3) to cause to be distributed to the entire membership, at least ten weeks before the date of election, in the official organ of the Society or otherwise, its own nominations and any nominations by petition that may then be available, provided that no person shall be listed as a candidate at any time until the committee has received his written acquiescence; (4) to set the date of election, and announce it to the Society at least ten weeks in advance; and (5) to instruct the Executive Secretary to submit during the sixth week prior to the date of election, to the voting membership for letter ballot, all nominations made by the nominating committee or by petition.

Sec. 2. Nominations by petition shall be subject to the following conditions: (1) each petition shall name but one candidate; (2) all candidates must be eligible to hold elective office; (3) a petition shall bear the signatures of at least ten voting members of the Society who at the time of signing such petition are eligible to vote in the forthcoming election. A voting member may not sign more than one nominating petition for President or more than one nominating petition for member of the Council; (4) petitions must be in the hands of the nominating committee by the end of the seventh calendar week prior to the date of election.

Sec. 3. All elections shall be by the Hare system of proportional representation. Candidates for the office of President shall be voted for by all members of the Society entitled to vote. The candidate receiving the highest vote shall be declared elected President and the candidate receiving the second highest vote shall be declared elected Vice President. The quotas of votes necessary to elect each of the remaining nine members of the Council shall be determined by the usual Hare rules applicable to an election at large.

Article IX

Society Publications

The Society shall publish (1) a monthly technical forestry periodical known as the JOURNAL OF FORESTRY, (2) a monthly official organ with respect to internal Society matters, and (3) such other publications as the Council may authorize.

An editor of Society publications may be appointed by the Council, at such compensation as the Council may direct, to serve as a staff member of the executive office. He shall perform such editorial and related duties as the Council and the Executive Secretary may assign. The Editor shall be assisted by Associate Editors, appointed by the President, of such numbers and fields of duties as may be authorized by the Council.

The official organ shall be known as Society Affairs. The Council may prescribe that it be printed as a section of the JOURNAL. Publication in Society Affairs shall constitute reference, distribution, and notice to the membership as provided in Articles IV, VIII, and X of the Constitution.

The Executive Secretary may be appointed by the Council to serve as Managing Editor of the JOURNAL for the performance of such duties as the Council may assign him. He shall be responsible to the Council for the business affairs and administrative policies of all Society publications.

Article X

Meetings

Sec. 1. The Society shall hold an annual meeting and such other meetings as the Council may direct. The place and date of the annual meeting shall be selected and adequate notice given to the Society at least three months in advance of the date fixed for the meeting.

Sec. 2. Resolutions adopted at the annual meeting by the vote of less than a majority of the entire voting membership of the Society shall represent the majority opinion of those voting members present and shall not be binding on the Society as a whole.

Article XI

Sections

Sec. 1. Sections of the Society may be authorized by the Council upon the written petition of thirty or more voting members, at least fifteen of whom shall be Members or Fellows, resident within a territory small enough to justify the belief that a strong local organization may be effected. Sections must hold at least one meeting each year to retain their authorization.

Sec. 2. The officers of each Section shall include a Chairman, a Secretary, and such others as may be found necessary. Section officers shall be voting members of the Society.

Sec. 3. Any Section may, subject to the approval of the Council, adopt for its own government such bylaws as it may find expedient, provided that no part thereof shall conflict with the Constitution of the Society.

Sec. 4. The Council shall have the right at any time to rescind the authorization of any Section and to terminate its existence.

Article XII

Subject Divisions

Subject Divisions of the Society may be authorized by the Council upon the written petition of twenty or more voting members of the Society engaged in the special field of forestry to which the Division pertains, at least five of whom shall be Members or Fellows of the Society. Subject Divisions shall be organized only as the Council is convinced of their need, and they shall be regulated through bylaws established by the Council.

Article XIII

Amendments

The Constitution may be amended by a two-thirds vote of the members voting, provided the proposed amendments have been submitted to all voting members at least four weeks in advance of the date set by the Council for counting the ballots. Amendments shall, unless they themselves provide otherwise, be effective immediately upon their adoption.

Bylaws

Headquarters

1. The official headquarters of the Society shall be in the District of Columbia.

Citizenship

2. Transfer of citizenship outside of the United States, its possessions, or Canada subsequent to election shall not invalidate membership or the right to vote and to receive the publications of the Society, but it shall prevent transfer to a higher grade of voting membership, and such members shall also forfeit the right to hold office as a member of the Council.

Schools of Forestry Classified

3. In pursuance of Article III, Section 5 of the Constitution, the Council shall designate as accredited institutions those colleges and universities offering professional forestry instruction that meet the standards of adequacy established by the Council as to curricula, faculty personnel, and related facilities.

For the purpose of determining the eligibility of graduates of accredited institutions for Junior Membership, the Council shall additionally designate as approved those curricula that contain all the minimum professional courses specified in Bylaw 5.

Membership Requirements

Student Member Grade

4. Requirements for Student Grade: Junior, senior, and graduate students regularly enrolled in approved curricula at accredited schools of forestry are eligible for Student Membership. Students eligible for Junior Membership shall not be eligible for Student Membership.

Affiliate Member Grade

5. Requirements for Affiliate grade: Training in forestry, or in related fields in wildland management or forest utilization, but of insufficient quantity to meet the requirements of the Junior Member grade, is the basic requirement.

Class A. Graduates of institutions which offer forestry curricula, but which have not been accredited by the Council of the Society, shall be eligible provided their instruction has included not less than one 3 quarter-credit course in each of the following subjects; silviculture, forest management, forest protection, forest economics, and wood utilization.

Class B. Persons who have had at least six years of practical training, or a combination of practical and theoretical training equalling at least six years, shall be eligible. Each academic term of appropriate theoretical training at ranger, vocational, or professional forestry schools may be substituted for one year of practical training up to a maximum of two years. Qualifying forestry experience, which may be considered as meeting the practical training requirements, shall be obtained while the applicant is regularly engaged in growing forests, with attendant duties such as management or protection of forest areas, supervision of silvicultural requirements in logging, erosion control, or similar forestry activities; regularly engaged in related wildland activities such as range, wildlife, or recreation management; or regularly engaged in those phases of utilization having a relation to the growing of forest crops.

Class C. Graduates of institutions which have been accredited by the Council of the Society, who have majored in wood utilization, wood technology, wildlife management, or range management where these curricula do not include all the five professional courses (silviculture, forest management, forest protection, forest economics, and wood utilization or technology) shall be eligible.

Junior Member Grade

6. Requirements for Junior grade: Theoretical training in the fundamental principles of professional forestry is the basic requirement.

Junior Membership is the temporary, probational, entrance grade for professionally trained foresters.

Class A. Graduates of approved curricula in institutions accredited by the Council of the Society shall be eligible on the endorsement of one voting member.

For a curriculum to be approved it must include not less than one 3 quarter-credit course in each of the following subjects: silviculture, forest management, forest protection, forest economics, and wood utilization.

Class B. Affiliate Members, who have had two additional years of qualifying forestry experience since being elected to the Affiliate grade, shall be eligible for election to the Junior Member grade on the endorsement of the Sections in which they are domiciled, provided that satisfactory evidence is submitted that during their total experience they have gained a knowledge of all the professional courses included as a minimum in an approved curriculum in an accredited forestry school.

Member Grade

7. Requirements for Member[2] Grade: Competence as a professional forester is the basic requirement.

a. Previous election to Junior grade.

b. Three years' experience in forestry, the purpose of which is to demonstrate that the applicant, in addition to his Junior requirements, has demonstrated his competence as a practicing forester to accept responsibility and perform duties of a professional character such as to justify the Society in accepting him as competent to represent the profession capably in the performance of his duties, and his adherence to such standards of professional conduct and character as to justify the Society in accepting him as competent to represent the profession honorably in the performance of his duties and in his relations with others.

c. Engaged in forestry work at the time of election. For prospective Members, who have full Junior qualifications, forestry work shall include all activities having to do with the management of forest land and the utilization of any of its resources. Forest land is any land on which trees are the principal crop or cover, or on which it is proposed to produce trees as the principal crop or cover, or land which forms an integral part of such forest land in management of said land, or land on which erosion control is practiced or planned, with aid of forest trees, or grazing land which forms part of an administrative unit whose principal function is forestry, or land on which game management is practiced in connection with forestry, or any similar lands on which the forest is an integral and dominant feature. Forestry work shall therefore include, for Members, the following activities as above qualified: arboriculture and municipal forestry; park management; recreational management; grazing; wildlife; protection including erosion control; fire, insects and diseases; streamflow regulation including chaparral areas; silviculture; forest management and administration; forest utilization including logging, manufacturing, and sale of products; research in any or all of the above fields; teaching in any of the above fields; office, supervisory, or administrative duties in any of the above fields; whenever the accomplishment of these aims requires the application of professional forestry knowledge.

d. Individuals who have not qualified for Junior Membership cannot obtain the Member grade. The two requirements for election to the grade of Member of persons engaged primarily with resources other than trees or forestry are Junior Membership, indicating the possession of basic theoretical training in professional forestry, and activities related to forest land as defined. It follows that persons who are not Junior Members, or Junior Members whose activities have nothing to do with forest land, such as the administration of grazing on the nonforested public domain, wildlife management concerned only with prairie or waterfowl management unrelated to forests, or erosion engineers in treeless regions, do not qualify as Members.

[2]Formerly Senior Member grade.

Except as provided for under qualifications for Junior grade, additional study shall count only as the equivalent of the same period of experience, it being the purpose of this grade to require preparation in both theoretical and practical forestry. A minimum of two years of practical experience in addition to study shall be required for Member.

Associate Member Grade

8. Requirements for Associate Membership. There shall be two alternate qualifications for Associate Membership.

Class A. Persons who have not the professional forestry qualifications of Junior Members, but who otherwise qualify as scientists for a grade equivalent to Member, which is the conception of this grade. Scientists working in the field of forest products but whose training has not included a large enough field of forestry to qualify as Junior Members belong in this grade. This grade includes graduates of specialized curricula in wood utilization, pulp and paper manufacturing, logging engineering, or such specialized fields as range management or wildlife, or other specialties, if said persons are equipped as scientists with a professional education equivalent to that of Junior Members but in their own field, and whose activities are conducted in close relation with forestry or foresters, in case such specialized curricula are not accepted by the Council as giving full professional training in forestry, belong in this grade. The same is true of economists in such subjects as forest taxation, land utilization, and the lumber industry.

Class B. Persons who are not possessed of a scientific education and are not pursuing scientific activities, but who through their public activities in connection with forest economics and forest policy or their individual efforts along any line of forestry, public or private, such as outstanding success in private forest management, have shown that they understand the fundamental objectives and principles of forest economics, management, and technical practice, and whose services in these respects are recognized generally by members of the profession who would normally be expected to know of their activities, are eligible for this grade. The words "recognized by the profession generally" will be taken to mean that if the members of a Section generally recognize that these services have a value to the profession generally, that is, extending outside the boundaries of the Section, the individual is eligible, if approved by the Council. Persons of lesser merit should be associated not with the Society but only as associate members of a Section, when its bylaws provide for such a grade.

Fellow Grade

9. Requirements for Fellow: Meritorious contributions to forestry, the basic requirement, shall include contributions to the application of forestry in any of its branches, to education, to research, to the advancement of the profession, and service to the Society.

10. With each petition nominating a Member for advancement to Fellow must be submitted an adequate biographical sketch of the nominee, including a record of his educatiton and training, professional responsibilities and achievements, previous special awards and honors, services to the Society, and other significant contributions and services. A factual biographical summary of each nominee, containing no more than 300 words, shall accompany the ballot.

11. The total number of votes necessary to elect a Member nominated to the grade of Fellow shall be not less than 50 percent of the total number of votes cast.

Membership Nomination and Election Procedure

12. Endorsement by a Section, as provided in Article IV, Sec. 2, may be accomplished either by vote of the Section or, when the Section bylaws so provide, by a committee of the Section empowered to act.

13. Publication of the names of applicants for membership as required by Article IV, Sec. 1, shall take place in SOCIETY AFFAIRS. For the purpose of such publication, "qualifications" is interpreted to mean a statement of the applicant's forestry education, with degrees and dates, his present position, and the date of his election if he is already a member in another grade. Upon request, any member entitled to vote shall be provided with more detailed information regarding the qualifications of any particular applicant.

14. The Council may elect an applicant to a lower grade of membership than that for which he was nominated, but not to a higher grade, without further publication.

15. An application rejected on the second ballot may not be resubmitted for the same grade of membership until after twelve months following such rejection. If the endorsers so desire, it may be resubmitted at any time for a lower grade.

16. The Executive Secretary shall promptly notify each successful applicant of his election and membership shall date from date of election, unless the Executive Secretary, as empowered by the Council, shall extend the period of acceptance as provided by Bylaw 38. If not accepted within 90 days after notification by the Executive Secretary, or within 90 days after the periods as extended by the Executive Secretary, election shall be void.

17. The Executive Secretary shall supply each newly elected member with a copy of the Constitution and Bylaws of the Society.

18. All applications, except of candidates for Fellow and Honorary Member, will be prepared on the printed forms provided by the Executive Secretary and approved by the Council. These forms will carry instructions as to how to supply the factual evidence required of a candidate's eligibility, in such matters as name, date and place of birth, education, professional experience, and other data.

19. Every applicatiton, except for the specific exemptions listed below, must be supported by three or more endorsements from voting members, who from their personal knowledge of the applicant and his work, can provide evidence of his eligibility. Endorsements are not required of the following classes of applicants.

1. Applicants for Student Membership.
2. Applicants for Junior Membership who are graduates of approved curricula in accredited institutions.
3. Applicants for Affiliate Membership who qualify wholly on the basis of education.
4. Junior Members eligible for automatic advancement to the Member grade.

20. All applications for membership in the Society will be sent by the Section or by the group of individual members who are sponsoring the candidate to the Executive Secretary at the Society's headquarters office in Washington, D. C. He shall check each application to see that the Constitution and Bylaws have been complied with as to endorsement and presentation of the factual evidence of eligibility. He shall acknowledge receipt of each application to the candidate, and shall inform him as to the procedure and approximate period required for election, the provisions of the bylaws as to dues, and any other facts deemed desirable.

The applicant's name will then be listed for publication, under the heading "Membership Applications and Advancements," in the next available issue of SOCIETY AFFAIRS. Such publication shall serve as acknowledgment to the Sections or groups of individuals sponsoring the applications. Copies of the application papers in each case will, on the appearance of such lists, be sent by the Executive Secretary to the Council for ballot with the exception, that in the case of applicants for Junior membership who are graduates of a school of forestry approved by the Council, the Council may delegate its authority to the Executive Secretary to declare such applicants elected after the publication of their names, unless for some reason they are unqualified or their candidacy should be referred to the entire Council. With the application papers will be included any comments on the applicant and his eligibility. Elections shall not take effect until after the expiration of the period of 30 days following the publication of said list. If within this period one or more protests against the election of any applicant are received, the Executive Secretary shall conduct such investigations as are necessary to obtain full and adequate information on which to make just

and final decision as to the eligibility of the applicant.

In case of a favorable vote, and in the absence of any protests, the applicant and his sponsors will be immediately notified of his election to membership by the Executive Secretary.

When an applicant fails of election the results will be reported back to the Section or group of members sponsoring the application. The reasons for this action will be included in order that the sponsors may be guided accordingly, if they desire to submit the case for a second ballot.

Official Membership Emblem

21. The official emblem is a shield with "Society of American Foresters 1900" in gold letters on a green background surrounded by a gold border. All members are entitled to wear this emblem.

Termination of Membership

22. Membership may be terminated by (1) voluntary resignation; (2) failure to pay dues; (3) expulsion for unprofessional conduct as provided in Article IV, Sec. 5.

A voluntary resignation shall be accepted by the Executive Secretary provided charges of unprofessional conduct are not pending against the member and provided the member is in good standing at the time and his dues are paid for the current year, except that the current year's dues shall not be required from members resigning prior to January 31, in any year.

In the case of a member whose dues remain unpaid on November 1, the Executive Secretary shall notify both the member himself and the Secretary of his Section, that the dues must be paid or a request for remission or postponement made within thirty days. For newly elected members the provisions of Bylaw 38 shall apply. If the dues are not paid, nor a request for remission or postponement made by the member or his Section within thirty days after such notice from the Executive Secretary, membership shall automatically terminate, unless charges of unprofessional conduct are pending in which case membership shall not terminate until the charges have been disposed of. A member thus dropped for nonpayment of dues shall not be eligible for reinstatement to any grade of membership until he shall have paid the dues in arrears at the time he was dropped. In no case shall this payment exceed six months' back dues.

In case either the member or his Section requests remission or postponement of dues, the Council shall act upon such request promptly. The Council may remit or postpone the payment of dues of any member upon its own initiative.

23. Notice of all terminations of membership shall be provided the Sections. The names of deceased members shall be published in SOCIETY AFFAIRS.

Unprofessional Conduct

24. It will be regarded by the Society unprofessional conduct for a member, when he has reason to know that an appointment to a position not yet vacant will be made possible by the dismissal for political reasons of the present incumbent:

a. To seek such appointment through political channels;

b. To accept such appointment.

25. The seeking or accepting of political endorsement for appointment to a vacant position does not necessarily constitute unprofessional conduct, but should be avoided as far as possible because it tends to identify the applicant with a political instead of a merit system of employment and to render him subject to dismissal when party government changes.

26. It shall not be required that all five members signing charges of unprofessional conduct, as provided in Article IV, Sec. 5, be prepared to submit evidence in support of such charges. The purpose of the provision is to prevent hasty action by requiring that the matter must be sufficiently serious, in the judgment of five members, to warrant further investigation by the Council.

27. Members prefering charges of unprofessional conduct will be expected to cooperate with the Council by submitting such evidence as they may have, or by directing the Council to other sources of information.

28. The names of persons signing charges in accordance with Article IV, Sec. 5, shall not be made known to the accused, nor shall he be informed that charges have been made unless and until the Council, after due investigation, shall have become convinced that such charges appear to be sufficiently well founded to be brought to his attention.

29. If, after investigation, any or all of the charges made under the provisions of Article IV, Sec. 5, appear to a majority of the Council to be well founded, a statement of such charges shall be submitted to the accused, who shall then have a period of sixty days within which to prepare and submit a written defense. After the expiration of such sixty days the case shall be submitted for the decision of the Council, by letter ballot.

The membership of a member charged with unprofessional conduct in accordance with Article IV, Sec. 5 shall not be terminated either by voluntary resignation or by failure to pay dues until the Council has disposed of the charges. Pending such disposition, a member charged with unprofessional conduct who ceases to pay dues shall not receive Society publications and shall not have the privilege of voting.

30. The Council may, under the authority of Article IV, Sec. 5, appoint a temporary committee to investigate charges submitted to it in proper form against a member, when, under Bylaw 29 the Council has voted to proceed with such investigation. Such committee shall be composed of from five to seven members other than the Council, a majority of whom shall be from the Section in which the defendant resides. The President shall designate the chairman. Within the period of sixty days allowed the defendant, under Bylaw 29, said defendant shall submit to the chairman of this committee the evidence for his defense.

The committee shall itself investigate all evidence for or against the defendant, and shall inform him of the general nature of the evidence in its possession in support of the charges. On the conclusion of this investigation the committee shall afford the defendant, if he so requests, an opportunity to present witnesses or further evidence in his own behalf.

On the conclusion of the hearing the committee shall transmit its report and evidence to the Council, together with its recommendations for action. Final decision shall rest with the Council under Article IV, Sec. 5.

31. a. When the Council declines to investigate the charges, the accused is not informed of their existence and any public reference to them is, therefore, wholly inappropriate. In occasional instances when the accused learns of the existence of such charges and wishes to have his name publicly cleared, the President shall, if specifically requested by the accused, publish a brief statement in SOCIETY AFFAIRS to the effect that charges of unprofessional conduct have been preferred against Mr. Blank, but that the Council has not regarded them as sufficiently well founded to deserve investigation.

b. When the charges are investigated by the Council and dismissed, the accused and the accusers shall be so informed, but there shall be no publicity unless specifically requested by the accused. In that case, the President shall publish a brief statement in SOCIETY AFFAIRS to the effect that charges of unprofessional conduct have been preferred against Mr. Blank, and after investigation by the Council have been dismissed as without justification.

c. When the charges are investigated by the Council and sustained, the President shall publish in SOCIETY AFFAIRS a brief statement that Mr. Blank has been found guilty of unprofessional conduct and has been disciplined as indicated.

d. When further information is requested by a Section of the Society, by an individual member, or by a nonmember with a legitimate interest in the matter, the inquirer shall be supplied by the President with a statement of the specific respects in which the Council has found the accused guilty of unprofessional conduct. The original charges may or may not be included as circumstances warrant. Supplemental statements of this sort may be published in SOCIETY AFFAIRS if there appears to be a widespread demand for

the information contained therein, but only with the approval of the Council.

c. When there is a general and legitimate demand for still further information, the President shall prepare a statement giving in full the reasons for the Council's decision, and including as complete an analysis of the charges and of the evidence relating thereto as may in his judgment be wise. This statement shall be submitted for the approval of the Council, which shall also decide whether or not it shall be published and if so in what form. The publication of any statement dealing with cases of disciplinary action in Society publications should be accompanied by a statement to the effect that it is published solely for the information of the members.

32. Action by the Council under the provisions of Art. IV, Sec. 5, shall be final.

Reinstatement

33. Except as provided below, a former member dropped for nonpayment of dues shall not be eligible for reinstatement to any grade of membership until he shall have paid the dues in arrears at the time he was dropped. Endorsement of his application is not required nor is the payment of admission fee. Publication of his name is required.

Former members who have served honorably in the armed forces and who were dropped for nonpayment of dues during such period of service may be reinstated without payment of arrears.

34. Members expelled or forced to resign because of unprofessional conduct may be reinstated only by unanimous vote of the Council.

35. Former members of a grade higher than Affiliate Member shall be eligible to reinstatement to the grade which they previously held, provided, in case of Member or Fellows, that they are engaged in forestry work at the time of reinstatement.

Dues

36. Members of all grades except Corresponding and Honorary Members shall be billed for dues by the Executive Secretary as soon as practicable after January 1 of each year. Those whose dues remain unpaid shall be billed again on or about April 1, and those whose dues are still unpaid shall be notified as soon as possible after July 1 that they are in bad standing and ineligible to vote, receive the Society's publications, or be a candidate for office until their dues are paid.

37. Members promoted to a higher grade shall pay the amount of excess dues over the former rate, dating from the date of promotion, except that Student Members advanced to the grade of Junior Member during the calendar year in which they are graduated shall not be charged Junior Member dues for that year

38. Under Article V, Sec. 3, the dues of new members shall be paid for the quarter during which they were elected, except that the Council may empower the Executive Secretary on request of the member to remit the dues covering a period up to six months from date of election, provided that for financial or other reasons he has been unable to accept election at time of notification. If at the expiration of said period the member renews his request for extension and the circumstances warrant such action, the Executive Secretary may remit the dues for a second period, not exceeding six months, or a total period not exceeding one year from date of election. New members shall receive the JOURNAL OF FORESTRY for the full quarter in which election is accepted and for which dues are paid. A new member who is already a subscriber to the JOURNAL shall be credited with the unexpired portion of his subscription at one-twelfth of the annual subscription rate, for each issue.

39. As provided in Article V, the Council may remit or postpone the payment of dues of any member on account of sickness, absence from the United States or its possessions or Canada, unemployment or financial stringency, temporary or permanent, or for other reasons which the Council may deem sufficient. In especially meritorious and exceptional cases when the member has rendered long and faithful service to the Society and when his financial status makes such action appropriate, the Council may remit dues permanently, providing at least eight members of the Council favor such action. Retirement for age from active forestry practice on a pension or a retirement annuity will not alone be deemed sufficient reason to grant a member permanent remission of dues or life membership.

40. The Executive Secretary is authorized, if and when the Section concerned so recommends, to place a member on the inactive list. The Section's recommendation must be based on satisfactory evidence that the member's financial circumstances warrant such consideration. Temporary service of a member in his nation's armed forces will warrant granting him, at his request, inactive status for the duration of such service. During such inactive period a member will not be required to pay Society or Section dues; he will not be allowed to vote or otherwise take formal part in Society affairs; nor will he receive the Society's publications. An inactive member may restore himself to active membership by notifying the Executive Secretary (preferably through his Section secretary), that he is ready to resume payment of his dues. He will not be required to pay up back dues for the period during which he was inactive.

Council: Nomination and Election

41. The date of election, to be selected by the nominating committee under provisions of Article VIII, Sec. 1, shall be not before December 1, or later than December 15.

42. The nominating committee appointed under the provisions of Article VIII, Sec. 1, shall be appointed by April first preceding the date of election and shall consist of three or more Members or Fellows. The names of the committee and the date of election shall be published in the May issue of SOCIETY AFFAIRS together with a notice calling the attention of the membership to the Constitutional provisions regarding nominations by petition, and listing the names of officers and Council members whose terms of office expire at the end of the current year.

A brief and strictly factual professional biography of each candidate for president shall be published in that issue of SOCIETY AFFAIRS preceding an election.

43. The ballots sent to the members shall (1) state the number of offices to be filled; (2) list the names of the candidates in alphabetical order; (3) give the address and Section membership of each candidate; (4) show the closing date for receiving the ballots; (5) quote the provisions of Article V, Sec. 3, regarding arrears in dues; (6) be accompanied by a return envelope addressed to the Executive Secretary and a smaller blank envelope for the return of the ballot. On the outer addressed return envelope shall be the directions, "After closing the envelope endorse your full signature on the back." All necessary checks to determine whether a member is in full standing shall be made without opening either envelope. The outer envelopes shall first be opened and laid aside, and when all valid ballots have been thus freed from identification, they shall then be opened and counted.

44. Ballots shall be sent to all Junior Members, Members, and Fellows, regardless of whether they are in bad standing. Ballots will be counted if the voters' dues are paid by the date of the election.

45. The ballots shall be counted by tellers appointed by the President. The results of the election shall be announced promptly to the winning candidates, to each of the several Sections, and to the Society at large by publication in the January issue of SOCIETY AFFAIRS. The results shall also be announced at the annual meeting if it falls on a fitting date.

46. Regular elections shall be held in the odd numbered years. Vacancies occurring between regular elections shall be filled by the Council, as provided in Article VII, Sec. 3. Such appointments by the Council shall be only for the period until the next regular election.

47. The President pro tempore appointed under the provisions of Article VI, Sec. 4, shall serve until the next regular election, or until the President or Vice President is able to resume his duties.

Such President pro tempore may be appointed either from the membership of the Council or from outside. If he is appointed from the Council membership, another member may be appointed to the Council to fill the vacancy.

48. Ballots under the Hare system of proportional representation, prescribed by Article VIII, Sec. 3, shall be counted by the method described in Leaflet No. 9 issued by the Proportional Representation League in March, 1921, or in Leaflet No. 9, revised edition, issued in October, 1925. "Majority quota" prescribed for the selection of President is understood to mean a majority of all the valid votes cast, arrived at through a series of transfers similar to those by which the minimum quotas are reached.

Officers: Duties, Etc.

49. The President, Executive Secretary, and Editor shall report to the Society at the annual meeting regarding their activities during the preceding year, and their reports shall be published in SOCIETY AFFAIRS as soon as may be practicable thereafter.

50. The Treasurer's report shall cover the fiscal year ending November 30, instead of the calendar year.

51. Chairmen of standing and other committees shall report to the annual meeting at the option of the President, and their reports may be published as the President may direct.

52. None of the elected officers of the Society shall receive compensation from the Society. An officer or delegate of the Society may be reimbursed for his actual expenses for travel and subsistence and other necessary expenses in attending meetings or transacting Society business, if specifically authorized by the Council.

Council: Duties, Authority, Meetings

53. The Council shall as need arises formulate and publish statements expressing the position or attitude of the Society on matters coming under the provision of Article II of the Constitution. On any subjects on which the membership has voted through a referendum, such statements shall be in conformance with the position thus taken by the Society. The Council may on its own initiative refer any such statements to the membership for ballot, and shall do so in case of valid appeal from its action, when taken by members in conformity with Article VII, Sec. 3, unless within two months from the date of receipt of said appeal the Council decides to adopt the position of the petitioners.

Referendum ballots when required by the above procedure shall be mailed only after the members have received at least one issue of the JOURNAL and SOCIETY AFFAIRS subsequent to the original publication of the proposals. Discussions of such proposals should preferably appear in these publications, but if deemed necessary by the Council or by the proponents brief summaries may also accompany the ballot. The final date for receiving ballots shall be five weeks from the date of mailing the same, and this final date shall be indicated on the ballot.

The right of appeal by petition, as provided and limited in Article VII, Sec. 3, shall lie against any action or position taken by the Council; provided that in the case of conflicting petitions or petitions opposing a referendum previously initiated by the Council but not yet completed, the Council shall determine the course deemed best for the orderly and effective management of Society affairs.

54. Meetings of the Council shall be held upon call by the President, or the President *pro tem*, or upon request by a quorum of the Council. Regular meetings may be held at such times and places as may be fixed by the Council. Except in case of emergency all members of the Council shall be notified at least 15 days in advance of the date and place of the meeting and, as far as practicable, of the principal matters to be acted upon.

55. In the absence of a quorum (six members) at any meeting of the Council, action may be taken subject to approval of a majority of the Council by subsequent ballot. A member unable to be present at any meeting may authorize another member (in writing) to cast his vote on any matter that has been presented for his consideration in advance of the meeting.

56. Absent members shall be notified promptly of action taken at meetings of the Council, even though a quorum may have been present, so that further ratification is not necessary.

57. Where prompt action is necessary, and in matters of routine or minor importance a majority of the members present at a duly called meeting of the Council can take action provided a quorum is present. The general policy, however, on important matters on which there appears to be serious division of opinion, will be to get the votes of absent members by mail before taking decisive action.

Between meetings of the Council, matters may be referred to it for decision by any officer, Council member, Section, or by petition of five or more members. Matters not previously discussed at a Council meeting will be opened to exchange of opinions for at least four weeks before a ballot is taken, provided that in matters of great urgency the President is empowered to call for an immediate vote of the Council. Such expressions of opinion as are received from Council members will accompany the ballot when it is presented to the Council for its final vote.

58. An executive committee of the Council, consisting of the President and such other members as the Council may select, may be designated for handling routine and emergency business of the Society.

Committees

59. Other committees than those provided for in the Constitution and Bylaws may be appointed by the President when the creation of said committees has received the approval of the Council. These may be either temporary committees, for some definite task, or standing committees, to serve until discharged or their successors are appointed. They shall consist of as many members and of such grades of membership as the President or the Council may determine. The members of all standing committees shall serve for the same term as that of the President by whom they were appointed, and until their successors are appointed. Members of all committees shall be appointed by the President, who shall, when possible, consult the chairman of said committee as to the other appointments. Temporary committees appointed for a definite administrative purpose are automatically discharged on the completion of their services. Temporary committees having charge of investigations may be discharged by the Council, at the request of the committee through its chairman, or on the initiative of the Council. Any member of any committee including the chairman, is subject to removal by the President with the consent of the Council, in the interest of efficiency, at any time during his term of office. The President may proceed to fill the vacancies thus created. No officer of the Society or member of the Council may serve on the Committee on Nominations for the biennial election, except that the Executive Secretary may serve as secretary of this committee without a vote.

60. No comtimtee shall expend funds of the Society except as duly authorized by the Council. Committees shall be supplied with necessary stationery and other supplies through the Executive Secretary.

Finances

61. The fiscal year of the Society shall end on November 30.

62. The Executive Secretary's books shall be audited semiannually by a certified public accountant, at the close of each fiscal year and at midyear.

63. The Executive Secretary and all employees handling funds of the Society shall be bonded in suitable amounts as decided by the Council, at the Society's expense.

64. All bills against the Society shall be approved by the person or committee authorized to incur expenses before they are paid by the Executive Secretary.

65. The funds of the Society shall be deposited in a bank, approved by the Council, or invested in federal securities or in a building and loan association up to insurable limits. This bylaw shall not be retroactive as ordering the sale of existing securities and reinvestment.

66. A budget showing estimated receipts and expenditures shall be prepared

by the Executive Secretary at the beginning of each year. Upon approval of the budget by the Council, expenditures within the limitations of the budget may be made by the Executive Secretary without further authorization from the Council. Expenditures for any purpose in excess of the amount allotted in the budget, or for purposes not provided for in the budget, shall require special authorization of the Council, except that minor transfers from one appropriation to another may be made without such authorization. The budget may be amended at any time by action of the Council.

67. The Permanent Fund of the Society shall be held intact and only the income from it shall be spent for such special purposes as the Council may direct. In the absence of such direction the income shall accrue in a special reserve fund, subject to such dispositions as the Council may make. The Permanent Fund may be increased from time to time through contributions for that specific purpose, or through action by the Council.

68. Special funds donated or set up for special objects shall be accounted for separately from the general funds of the Society.

Meetings

69. A committee on Meetings shall be appointed by the President to consist of such number and such grades of members as he may think best. The chairman of this committee shall be a Member or Fellow and shall be appointed by June first of the current year. Such appointment shall be announced promptly in SOCIETY AFFAIRS.

70. The committee shall be responsible for the technical program of the meeting, but not for the program of the business meeting. It shall appoint or select speakers and topics and shall prepare a preliminary program and submit it to the Executive Secretary in time for him to have it printed and mailed to the membership. The Executive Secretary shall have the program printed and mailed to the members at least five weeks before the date of the annual meeting.

71. A member desiring to present a paper at the annual meeting shall notify the committee on the meeting, either directly or through the Executive Secretary, at least seven weeks before the date of the meeting, of the title of his paper, and shall at the same time submit at least a summary of the paper. It shall be optional with the committee whether such paper shall be read and discussed at the meeting, or read by title only.

Society Publications

72. Forestry students not eligible for Student or Junior Membership may be granted the privilege of subscribing to the JOURNAL OF FORESTRY at a reduced rate so long as they are bona fide students.

73. A member in arrears for dues on July 1 shall receive no more issues of the JOURNAL until his dues are paid. Upon paying his dues he shall be entitled to receive those issues of the JOURNAL that he has missed, if he so requests.

Sections

74. Every member of the Society in good standing, of whatever grade, is automatically entitled to membership in that Section of the Society in which he shall establish his domicile. The domicile of a member shall be his home or residence, unless his place of business and his professional affiliations lie within the territory of another Section, when, by declaration he may establish his domicile with said other Section for the purpose of Section membership. An individual can be a voting member of only one Section, but may become an associate member of any other Section.

75. Each Section shall confine its regular membership to individuals whose domicile, as above defined, is within its territory, but may admit associate members to the Section who reside elsewhere.

76. The Executive Secretary shall furnish to each Section secretary near the beginning of each year the names and addresses of all members of the Society in good standing within the territory of the Section. He shall also notify the Section secretaries from time to time during the year of changes due to death, resignation, termination of membership, new elections, or transfer from one jurisdiction to another.

77. The Section shall report promptly to the Executive Secretary of the Society the results of elections of Section officers; the adoption of Section bylaws and amendments thereto; and shall report at least once a year on the proceedings of the Section.

78. The Section secretary shall furnish the Editor with copies of such papers delivered before meetings of the Section as seem appropriate for publication in the JOURNAL, unless the author desires to make other disposition thereof.

Section Chapters

79. A Chapter of any Section may be authorized by the officers or executive committee of the Section upon written petition of fifteen (15) or more voting members of the Section resident in an area where a strong local organization may be effected. The boundaries of a Chapter shall be established by the Section on recommendations from the members concerned.

Chapters shall hold at least one meeting each year to retain their authorization. Open meetings are specifically authorized.

The officers of each Chapter shall include a chairman, a vice chairman, and a secretary-treasurer, who shall be voting members of the Society, serving concurrently with the officers of the Section, and elected by the members of the Chapter. A current list of the officers and the members of each Chapter shall be on file with the secretary of the Section.

A Section is authorized to appropriate funds to the Chapter for the conduct of its business.

Actions or recommendations of a Chapter on Society matters will be transmitted to the Council with the recommendation of the Section. The Section shall have the right to rescind the authorization of any Chapter and to terminate its existence.

Subject Divisions

80. The purpose of Subject Divisions of the Society shall be to provide an effective means of considering various phases of forestry, supplementary to that provided through Society or Section committees, and not to create vocational groups within the Society.

81. Membership in Subject Divisions shall be open to all members of the Society, the basis of membership being interest in the subject and desire to participate in the work and discussions of the Subject Division.

82. Subject Divisions shall be governed by the same regulations, prescribed in the Constitution and Bylaws, as are committees of the Society with respect to Society policies. They shall not issue to the public any statements or reports, except (1) through the Sections of the Society, if approved by said Sections, and in conformance with adopted policies of the Society, or (2) through the Council or ballot of the members if involving controversial questions requiring Society approval.

83. The same freedom of discussion is permitted to Subject Divisions as to Sections and the Society at large, and the same principles of publicity through the JOURNAL apply to Subject Divisions as to individuals, Sections, and the Society.

Bylaws and Amendments

84. All Bylaws shall become effective upon adoption unless otherwise specified by the Council.

85. All Bylaws shall be published in SOCIETY AFFAIRS or otherwise made available to the members, as soon as practicable after adoption.

86. The Executive Secretary shall notify all members, through publication in SOCIETY AFFAIRS or otherwise, of the adoption of any amendments in the Constitution or Bylaws.

Journal of Forestry

VOLUME 55, 1957

Published by the

SOCIETY OF AMERICAN FORESTERS
Mills Building, 17th Street and Pennsylvania Avenue, N. W.
Washington 6, D. C.
1957

Journal of Forestry

Official Organ of the Society of American Foresters

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Manuscripts, subscriptions, advertising, and other business matters should be sent to the JOURNAL OF FORESTRY, 425 Mills Building, 17th Street and Pennsylvania Avenue, N. W., Washington 6, D. C. Closing date for copy, six weeks in advance of date of issue.

The pages of the JOURNAL are open to members and nonmembers of the Society.

The Society is not responsible, as a body, for the facts and opinions advanced in the papers published by it.

Missing numbers will be replaced without charge, provided claim is made within thirty days after date of the following issue.

Entered as second-class matter at the post office at Washington, D. C. Published monthly. Subscriptions: $7.50 a year; 75 cents a single copy.

Acceptance for mailing at special rate of postage provided for in the Act of February 28, 1925, embodied in paragraph 4, Section 412, P. L. & R. authorized November 10, 1927.

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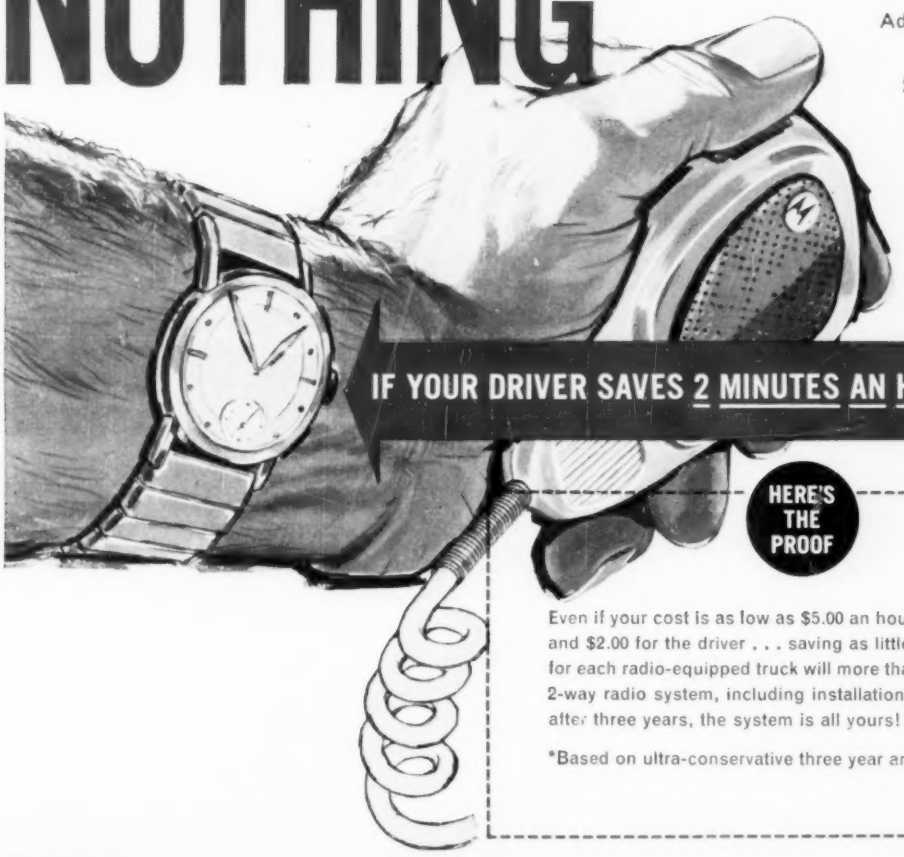

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